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Presidential Address

ON

THE UNIVERSITIES IN MEDICAL RESEARCH AND PRACTICE.

Delivered before the Eighty-eighth Annual Meeting of the British Medical Association in Cambridge

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[Sir Clifford Allbutt began his address with a vivid review of the social and artistic development of England when the claims for continental dominion were relinquished, in the course of which he showed that the older Universities, at home and abroad, were not "founded" as such, or as we know them, but grew with the needs of the age.

THE UNIVERSITIES AND THE PROFESSIONS.

He proceeded to show that the Universities, ancient and modern, have made the professions by the fostering of research and the maintenance of due standards. Instancing Greek and Roman examples, he insisted that no particular calling can be followed without an education which connotes a more comprehensive design. "We are teaching Medicine well; but we need badly *a common literary basis*." Regarding education from the first as an introduction to life, he pointed out alike the danger of specialisation and cramming. He insisted on the need, met at Cambridge to some extent by inheritance from forefathers, of imagination in the pursuit of learning, and recommended the simplification of the necessary years of pupilage in medicine—"five years is long enough in all conscience for a young man to spend in learning to be a safe practitioner"—by the recognition of one curriculum for a diploma, and another, of extended form, for the University degree. The candidates for the diploma—and he favoured a one-portal system—would put immediate utility in the first line, while each University would be left free "to mould its teaching after its own fashion and standards, and to transform its interior tests." He concluded this section of his address by affirming that the medical curriculum could be substantially lightened by better teaching, and described the structure and aims of the educational course for medical students at Cambridge. He continued:—]

THE DEBT OF OTHER SCIENCES TO MEDICINE.

My old medical friend, Mr. Meade, of Bradford, was almost the only man who knew much about flies at the time when Manson and Ross began to watch these little pests. Without Medicine bacteriology, and the study of the cell, would have made slow way; yet it is the study of the cells of bacteria, of algæ, of protozoa—not of mandarins—which has brought us nearer to the secret of life. On the wonderful world of the cell I have spoken before. Professor Hopkins has lately described to us the almost incredible coexistence in it of different constitutions, phases, and events; though every change in any phase affects the equilibrium of the whole cell system. And every one of these is essential to the whole; "so long, for example, as a liver cell remains alive its glycogen constituent cannot be wholly removed." If a cell be so ground up as to become more homogeneous, its reactions fall out at haphazard, and the cell dies by mutual destruction of its parts. This process of nature is illustrated on a mighty scale to-day in the disintegration of the Russian social organism.

Some of the apparently simple cell constituents, hæmoglobin, for instance, are incredibly complex; this substance is specific for every kind of animal; in allied species, if concordant, it is not identical. Of the chromosomes I need say nothing, except to hope that as X rays have analysed crystalline structure some such rays may analyse nuclear constitutions.

By another way Medicine has promoted research on organic syntheses; and conversely on the reduction of foods into the more complex amino-acids before being rewoven into the tissues of life. From Medicine began our recognition of the plowman as the first parent of animals and man, and our fuller knowledge of "the green plant as the fundamental capitalist."

> Herbs gladly cure our flesh, because that they
> Finde their acquaintance there.

In the dark soil the nitrifying bacteria live on inorganic matter; so in the light some inorganic colloidal systems can build up formaldehyde (B. Moore). Medicine has introduced the chemist to the domain of the hormones and chalones, themselves also bodies of the simpler chemical constitution—some crystallisable, all able to resist prolonged boiling—blended into a wonderful physico-chemical coördinating system, secretly at work all the time under the diagrams of the innocent neurologist. We may suppose, indeed, that every active tissue of the body, or every cell, even of bone and skin, or of the substrate of mind itself, like every individual of a social organism, contributes some element to the organic whole, some inward production necessary for growths or for signals.[1] There may be a world of pathological (alien or perverted) hormones as yet unexplored. May the dive inwards of epithelial cells in cancer be due to some inversion of chemotaxis, possibly under the influence of an alien (parasitic?) enzyme? Within the body, then, all parts are the "environment" of each—so that we have both an inner and an outer "climate," an aspect of the microcosm not to be forgotten in the field of mental disease. Thus it is that "Each part may call the farthest, brother." And these agents have a field of action far beyond the body, as we see, for example, in the sexual hormones. If there be a "migration hormone" its sphere is the world.

Again, is it not largely by Medicine that the study of enzymes has thrown light upon the operations of catalysis which, like the rollers under a log or, as we now think, more by engagement and disengagement like rack and pinion, is incessantly forwarding by various intermediate series and by reversible actions at points of concentrative equilibrium the processes of nature? The vitamines may be of this kind, agents which have upset our cruder calculations of nutritive values; for instance, in the feeding of children we no longer take cane sugar to be the vital equivalent of lactose, nor margarine of butter; not all the nitrogen of nutrition is included in protein, nor are phospho- and amino-lipins, nucleic acid, amino-acids, and so on, mutually convertible in the body. We must admit that the fundamental principles of nutrition have yet to be redetermined. Moreover, the war has forced us to remember the mutual dependence of food kinds; that of course fats and carbohydrates are not wholly independent or equivalent; the carbohydrates cannot make up any great lack of fats, nor can oxidation of fats proceed in the absence of carbohydrates.

Another system of balances in the body, as of the reciprocal functions of lung and kidney, is more obviously chemical. Medicine has taught us how the lung deals with the CO_2 ions, the kidneys with sundry other acids, so that the blood reaction is maintained with extreme nicety; and that other systems—for example, the vasomotor—are probably little less sensitive, and that there are other subtle causes of anoxæmia besides the cardiopulmonary (Haldane); so that in Medicine it is of the first importance that in all abnormal conditions the oxygen tension of bloods should be systematically ascertained and compared. The hydrogen-ion concentration is consistently higher upon flesh diet, lower upon vegetable diet; but, I think, we have not yet learned to discriminate so subtly as Charles Kean, who is said to have chosen his viands according to the parts he had to play—pork for tyrants, beef for murderers, mutton for lovers.

Next after the origin of life itself, from ancient times to this day no enigma has attracted and baffled the curious mind of man more than that of living "form."

[1] Mathews: Physiological Chemistry, second edition, p. 835.

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Many of our keenest minds—Haldane, D'Arcy Thompson, Osborn, Dendy, McBride, I mention a few names as they occur to me—are still chasing this will-o'-the-wisp; and moth-like I cannot but flutter after them. Of the nitrifying bacteria which assimilate inorganic matter, of the synthetic amines of animal nutrition, of the properties of colloids, I have spoken already to-day and last year; but "how," says Dr. Haldane, "is constant form maintained amid the continuous changes of our changing matter?" and—I may add—of variations of parts. Is "form" something after the manner of a seal, which is impressed upon matter? or is it, in Aristotle's sense, a kind of soul (entelechy) which shapes the potential, or capacity, into integral being? Here we hover between metaphysical or ontological concepts and natural law, or the properties of matter. A few years ago all notion of self-shaping was dismissed, and the animal regarded merely as a diagram of incident forces; to-day there is some harkback, if not to moulding entities, at any rate to some phases which partake both of germ and matrix. We had been taught that for development functional stimuli were all that was necessary; for instance, that the heart grew, even beyond the normal, only in response to demand for its work and by increased supply of blood to its tissues. But is there any functional adaptation from within? If a limb be not used the bone will still grow more or less; but why does the bone grow *round?* And an eye will grow, from a germ of it, in the dark (Loeb). Is there such a property in living matter as "functional adaptation"? Is function in its effect upon form adaptive or purposive? Is environment met by adaptive variation—for instance, in a germ cell? Again, if so, can specific properties of such a kind be acquired? Biologists seem to have proved that evolution of form may go on continuously when environmental change is suspended, or remains constant; and conversely that environmental change does not necessarily induce evolution. On a broad view, says Professor Osborn,[2] during the infinite variety of the widely diverging forms of the Mammalian period of the earth, the reptiles have shown very little change. We perceive that these questions arise in some contrast with the hypothesis of the selection of "chance" variations.

On the other hand, we find reason to marvel at the constancy of bacterial species; humble and embryonic beings that we should not expect to have become fixed in their habits. Yet they and their enzymes are very exacting about it; as we find, for example, with the several enteric bacteria or with the meningococcic or pneumococcic varieties, of which each has its own serous or agglutinin test, and is indifferent to the rest. And there is more still to be said; when the microbe finds itself in the host's body it may be wholly out of tune, or wholly in tune, with any or all cells that it approaches; in either case presumably nothing morbid would happen, perhaps, by a kind of zygosis, a benefit; morbid happenings would lie between this microbe and body cells within its range but not in tune with it. Now there seems to be reason to suppose that a microbe, on its approach to a body cell only just out of its range, may try this way and that to get a hitch on. If so, the microbe, at first innocuous, would become noxious. So on the other hand body cells may educate themselves to vibrate in harmony with a microbe before dissonant; or there may be mutual interchange and coadaptation. Such considerations arise out of many known phenomena at phase boundaries, of sympathetic vibrations, of acquired immunity, of new virulences, and so forth; the cells out of tune getting nearer and nearer into consonance with each other.

But, if things be so, surely we are face to face with a marvellous and far-reaching faculty, *the faculty of choice*, and this rising from the utter bottom of biology to the summit—formative faculty—"auto-determination," or, if you please, "mind." Can the microbe do as the retriever does when with a hare in his mouth he comes to a gate; he tries this way and that, then thrusts the hare under the gate, leaps over and pulls the hare through? So the microbe tries it on, this way or that, till it succeeds, by self-education in the school of experience—*Bildungstrieb*. This is far more—radically more—than "*élan vital*"; not merely energy but *choice*—plasticity driven to choose or fail; thus new devices are tried and new habits established. So likewise Dr. Topley has dwelt upon a microbe acquiring a capacity to bring about certain fermentations,[3] an ability, as he says, "to be regarded as something inherent in the organism itself." We may be reminded also of Professor Stanley Gardiner's "education" of his oysters—a very curious observation.

So far as I can think upon it there seems to be but one alternative hypothesis, but this does not cover so many phenomena. As I have said, if the vibrations of an alien cell are out of range of a certain body cell so as just to be indifferent but yet not far out of range, the vibrations of the one might induce like vibrations in the other, and meanwhile interference waves would arise in the field; thus disturbances—symptoms—would begin and continue until the two sets of waves should blend into unison; and this would mean acquired immunity. If a number of wag-at-the-wall clocks are hung near each other, in a calculable time they will get to swing in unison. But this hypothesis does not lead on, as does the trial and error hypothesis, to larger and larger gains. We see only a discord and a mode of requiescence; no line of development. What we apprehend is something more than orderliness of chemical reaction; that *cells are teachable;* a key to illimitable progress. Was not Coleridge right when he said—

> "For I had found
> That outward forms, the loftiest, still receive
> Their final influence from the Life within."

I am not for one moment forgetting that the physical modes of energy—adsorption, surface tension, and so forth—may count for much in these advances, arrests, immunities, and disintegrations. Adsorption, or other physical condition, may put up a block. How remarkable are the effects of anæsthesia and palsy which may follow injections of sodium oxalate and magnesium sulphate, and of their quick removal by calcium salts; indeed, the whole influence of calcium on metabolism—probably all of them surface (interface) actions, as of any radio-active element upon cell function.[4] Indeed, as in the relation of foodstuffs to amines, so in the physics of the cell we may discover a comparative accessibility and intelligibility of the processes of life—Poincaré's "*simplicité cachée.*" It seems that God has more "respect to the measure and ease of the human understanding" than Boyle supposed.

RESEARCH.

Thus we are led to the thaumaturgic word "Research" which, for some of us, means remote and rather unreal speculations; for others the discovery of short cuts to making more money; for others again the ideal of pure knowledge. Research may be regarded as of two kinds, as natural observation and as artificial experiment; the one yielding more and more to the other as investigation penetrates from the more superficial to the deeper processes. Still, if we are to surprise and "capture wild nature in her secret paths," the two ways are strictly inseparable. Indeed, the infinitely little does man more harm that the enormously great. War may bring with in some redemptive virtues; pestilence only raw superstitions. The advance of the last half century from the deadhouse pathology to more refined and penetrating methods we have witnessed in our time, and yet more intimate methods, those of biochemistry for instance, are being rapidly unfolded. Research, as it is working to-day, advances from fixed and measured bases; as observation it watches Nature's march past; then as experiment it puts events to test under artificial conditions of separation or isolation, and measures their phases. But the laboratory cannot, as Nature does, contrive the unexpected; so we must "gear up our tiny machines to the vast wheel of Nature," and try for a first roughing out of an idea or concept. If we are to select our facts

[2] Osborn: Origin and Evolutions of Life, p. 137.

[3] THE LANCET, May 22nd, 1920, where he quotes "Penfold and others."

[4] Gates and Meltzer: Rockf. St., vol. xxv., and Journ. of Physiol., Feb. 20th, 1920.

to any considerable purpose as crucial, we must first have an idea in our minds; and for this a certain kind of imagination is needed, one of general concepts rather than of the concrete individualising imagination of the artist. Thus there are two kinds of discoverers, whose comparative outlines we have not yet well discerned. Of scientific discovery Henri Poincaré gives an interesting appreciation; he says that discovery consists of three stages: the first stage is of laborious work at the problem on all sides; the next is not one of conscious occupation with the subject, but of unconscious cerebration, during which a promising hypothesis may unexpectedly arise in the mind; the third is deliberate verification and completion of form. Thus out of an unlimited number of possible combinations, and by many speculations, the discoverer at length divines the true one. In Medicine this has been clearly the course of surgery, the side of Medicine which is closer to nature.[5] The surgery of my young days was only too "observational"; the friendly fingers of curious colleagues were popped in and out of an operative incision with no apprehensions about "the infinitely little." Now the observer is sadly pushed aside; the ritual of surgery is become like the magic rites of old, of which, if a point were dropped or a word changed, the virtue went out. But the rite could be done over again by the penitent; unluckily in surgical rites there is little room for repentances.

A new scheme of research into the origin of diseases, lately instituted at St. Andrews, claims our respectful attention. And may I be forgiven if here I pay a tribute to the rare devotion which inspired Sir James Mackenzie to forsake place and honour to follow after knowledge; indifferent whither he were led so long as truth was the leader. Sir James Mackenzie argues that the man in charge of the first deviations from health is the general practitioner; and that, if we are to detect diseases in their incipience, he must be the detective. One evening about the year 1879, when staying with Sir George Humphry, he and I sat into the small hours devising a method by which we hoped to engage the general practitioner in scientific investigation. We secured the coöperation of this Association and of many coadjutors[6]; Dr. Mahomed joined us as secretary. We hoped by gathering in large numbers of observations to eliminate error; and several series of questionaries were distributed. Four volumes of reports were issued, under such editors as Humphry himself (on Old Age), Butlin (on Cancer), Whipham (on Rheumatic Fever), and Isambard Owen (on Intemperance). But the effort was premature; the data were too rickety, the reports too often irregular, dilatory, and imperfect, and the reporters untrained in observation, punctuality, and precision. As things are few of our colleagues remember to let us know the issues of cases seen in consultation. We may hope now for better material and more accurate workers; not only so, but Sir James Mackenzie is developing another and no doubt better method—he is working with intense culture on a small holding and on a more intimate clinical plan.

In exploring a country the great watersheds and rivers are first laid down; to map out these and their valleys and tributaries is the first great work. These main features known, bearings are obtained whence to discover the contours of the hills and to track up to the hidden sources of the streams. This is Sir James Mackenzie's mission—to track out the nascent rivulets, and with his divining rod to dig for the springs which feed the streams of disease.

Let us not suppose that this research will be but a matter of cleverness, sagacity, or even of intensive observation; nor flatter ourselves that because Mackenzie produced his great work on the Pulse while a general practitioner that he achieved this by ordinary clinical observation, however acute. The progress of Medicine must in large part be endogenous. While our pathologists in balloons were working on morbid phenomena without ever seeing a sick man, Mackenzie was bringing laboratory equipment and exquisite laboratory methods to the bedside. The polygraph, no easy instrument to handle even now, was the grandchild of the kymograph; and by it was proved again that science consists—as Plato said five centuries before Christ—*in measurement*. So in the St. Andrews research, not only have the initial warpings to be discovered, in their many ways and tides, but their volumes and their curves also to be measured as precisely as were those of the circulation by the polygraph. The physicist and the biochemist will need all their expertness in valuing molecular motions, analysing secretions, recording blood tests and morphologies, and so forth in their earliest and subtlest phases. For it is in molecular dynamics that the first deviations will arise; massive visible changes come later, and happily are now in large part calculated or calculable. Mere observation—Nature's march-past—will not count for much now; and as to family histories—well, they vary with each historian. And we practitioners will need a more searching discipline before we can occupy ourselves with problems so subtle.

The laws of inheritance must, I think, be sought out, at any rate at first on animals; the generations of Man are too long for comprehension; besides, something else seems lacking in this study of the Genetics of Man? ..... Is it a sense of humour?

COMPARATIVE PATHOLOGY.

And there is something more to be said. If light is to be thrown upon the generation of diseases in man it must be in part also by study in a far larger field we must discover and compare the elements and phases of disease in animals and in plants. Sir James Paget, in his admirable address to the Pathological Section of this Association at Cambridge in 1880, reflected on the difficulties of human pathology because of its great complexity. He had "long and often felt that in this difficulty we might gain help from studying the consequences of injury and disease in the structure of plants" as less complex and under simpler conditions. To this field of pathology he devoted almost the whole of the address. A large part of my address in Medicine to this Association in Glasgow in 1888 was given to this appeal; it has found no response, hardly an echo. Yet what would anatomy be without comparative anatomy, language without comparative philology, anthropology, law, history, and even religion without a like comprehension? Without an Institute of Comparative Pathology in Cambridge our range of vision and work is contracted. In the "field laboratories," it is true, Professors Woodhead and Nuttall, ably seconded by Dr. Stanley Griffith, are doing as much as lies in the power of a few individuals; but any such effort is puny beside the sphere of observation and research awaiting us. The comparative survey must cover the diseases of plants as well as of animals, of the lowest of living things up to the highest. The money loss year after year caused by the depredations and the diseases of animals and plants is enormous, and many of the methods of dealing with them—as with foot and mouth disease and swine fever—barbarous, if at present imperative.

Yet no one stirs, save to gyrate each in his own little circle. There is no integration, no organisation of research, no cross light from school to school, no mutual enlightenment among investigators, no big outlook. The destruction by insects in forestry and agriculture alone in Great Britain is put at £30,000,000 per annum.[7] An Institute of Comparative Pathology in Cambridge, with the endowment of professorial chairs and subordinate workers, would cost, no doubt, a quarter of a million, a big sum; but what is this to the wastage of disease throughout the world of life!—to swine fever, diseases of cattle and horses, of crops, of forests, and so forth—utilitarian ends it is true, but to be followed on paths of discovery which would illuminate the whole field of nosology. Diseases are not "entities," nor even recurrent phases of independent events, but partial aspects of a universal series. The young graduates we have, many of them of great capacity; but every day we are losing them because they are not taken up at once into scientific teams; so they slacken, or drift into

[5] See C. A., Hist. Relations of Medicine and Surgery.
[6] See Sir G. Humphry's Presidential Address at Cambridge, 1880.
[7] Mr. L. Scott, M.P., in the House of Commons.

some other means of livelihood, and things muddle on as before. How blind we are!

PSYCHOTHERAPY.

[Here Sir Clifford Allbutt reviewed with force and pungency the modern developments of psychotherapy, for, "of late, their pursuit has stirred up much, and once more the human heart is declared to be a very messy place." With shrewd criticism of a certain side of psychoanalysis, he admitted the power, for good and evil, of suggestion in the life of a social animal, and the value of modern clinical research into the psychic complement of structural diseases.]

The moral on the whole is, he said, that we must use much circumspection in straying beyond the strand of experimental psychology—a fruitful inquiry so long as pursued on the methods of science. I do not say that in its applications to the many and variable callings and stresses of life, there is no place for psychic empiricism, no place for prying beyond the margins of evidence; but the surer must be our footing on the known, and the closer our watch upon our terms. Not for one moment do I forget the admirable work done in psychology in our own laboratories, at Oxford, and in the great pathological schools of the Maudsley, and the London Hospitals, and elsewhere. And the methods of the Industrial Fatigue Research Board, for the study by "vocation tests" of the "psychological relations between management and labour," seem to me, if I may say so, to be on sound lines, and to be likely to shed light upon the economy of both mental and bodily work. Again, such researches as those of Dr. Scripture on the speech of epileptics, whether verified or not, are at least conceived on sound lines of scientific method.

The black fate which befell the insane, once so humanely, rationally, and happily treated by the ancient Greek peoples from Empedocles to Galen or later, is one of the monstrous depravities which befoul the history of man; centuries of cruelty which lasted down to our own times.[8] When a Commissioner in Lunacy I did my best, encouraged by the late Dr. Hack Tuke, to convert the plans of new asylums from the barrack system to a village system; but every such attempt was thwarted by a stolid, idealess body, the Local Government Board of that day. A village community, with its homely associations, its groups of cottages, hospital, park, gardens, home farm and workshops, church, town hall and theatre, and its various social scenes and interests, would provide for nervous disorders of all kinds, and so lighten the shadow of insanity. Patients could be moved within the groups from one section to another without formal inquisition; with no more ceremony than precise entries in the casebooks open to the Visiting Justices. In the treatment of any case of mental disorder the physician may soon, and often suddenly, be faced with the necessity of bodily restraint; and I cannot satisfy myself that patients should become liable to mechanical restraint or to confinement without the strictest precautions and guarantees. At Whitehall we were never without some information, only too often true, of concealment of insane persons, and of their ill-treatment in the sense of cruelty, or of bonds, or of coercion, or of neglect of proper domestic or medical care. The present obstacles to early treatment, it is true, are a grave hindrance to successful therapeutics, but the legal and practical problem is more intricate than public opinion is aware of.

GENERAL PRACTICE.

When I turn to Public Medicine I am met by two chief problems that call instantly for solution. If by studying the past we can better build up the future, what will history tell us of the future of the "General Practice" of medicine; and what of the Voluntary Hospital? He is a bold man who will pretend to foresee even the near future of either; yet neither can stand where it is at present. Let us consider General Practice first.

In England we cling to concrete experience; we look for friction, unexpected turns, compromises, chances; we have little belief in systems of thought and dialectics, and in medicine, as in political and social affairs, have trusted to experiment, to touch; we find safety not in ideal revolutions, nor in rigid organisation, but in broadening down, in criticism, and in the fertility of intuitive action. Scientific therapeutics are not to cast out empirical methods. The compass of large principles is often too wide for daily needs. We want theories within theories, axioms of less scope but more readily adaptable to the wantonness of life. Very true; but also the craftsman must bow his head to the deeper and wider principles which will eliminate the inessentials and economise the direction of his work. If the family physician must be rather receptive than productive, by the diffusion of scientific knowledge, and increasing familiarity with the spirit of science, the climate of thought will be changed throughout the profession.

The better class of general practitioner of 50 years ago was rather after the kind of Hippocrates or of Paré than of the modern graduate. His university, in the days before great cities—the "great wens" of Cobbett—was nature; in his clinical experience he enriched the instruction, half empirical, half dogmatic, of his medical school by the shrewd, observant, self-reliant, resourceful qualities of the naturalist. His science and his practice were of the naturalist, not of the biologist. In my early days a country drive with such a doctor in Yorkshire used to be one of the rewards of the consultant; and a bedside talk with him a lesson in quickness of wit and hand, and of instructive inference and prognosis. He was as clever as the modern cardiologist in knowing when to give digitalis, when to withhold it; if he were content to diagnose a case as "some bedevilment of the liver," his rules of thumb were not without their efficacy, and his *flair* for the issues of disease marvellous. He did not come across much "science," and what he did see of it, chiefly in casual "locums," did not attract him; for in truth half-science was less useful to him than whole craftsmanship. He was a woodland guide, not a geographer; but, as Aristotle and Darwin well knew, the woodlander gathers much curious lore. However, in the march of intellect this comrade, kindly and loyal as he was, is gone: and his sort of wisdom dies with the individual. Who is to come next? The official doctor, or a family physician more intellectual and no less independent?

An official doctor would be as alert and as progressive as a country parson, whose service is not much kindled by the chances of promotion to an archdeaconry or a bishopric; while to shift an official doctor from place to place would be to cut the inner threads of those intimacies which we are now declaring to be clews to the detection of diseases at their sources. Yet, as things are, the independent practitioner is isolated; even in a town he is apt to make a little orbit for himself, to drift out of intimacy, perhaps into some jealousies, with his brethren; he lacks mental incentive, and gradually lets slip occasions of scientific reunion and renewal. Indeed, he cannot readily leave home to attend public and scientific meetings, so that too often—as Morant complained—"medical men do not think nor express themselves in a statesmanlike way." His time even at home is so broken up that he loses the habit of study. He may leave his hospital school full of ardour and in rapid growth, but in practice his ardour cools and he drops into routine; or, at any rate, such is his peril, and so less and less may the doctor feel himself a member of a great profession; he may drift out of public affairs, his outlook and sympathies may shrink, his work become a trade, and his medical neighbour his "opponent."

Again, for some years past a few of us have been protesting against the clipping of family practice by official shears. We see the subjects of infectious fevers carried into isolation, and the tuberculous and syphilitic disappearing with them. The children are turned over to the school doctor, the parturient woman to the new midwife, and so forth. What is to be the end of this pollarding of family practice? Are its branches to be scattered about in a wilderness of "specialists" and the family physician a mere sweeper up of unconsidered trifles?

Panel practice, for some time discredited by its hereditary taint of the Club of infamous memory, and

[8] Pinel d. 1826; Schröder v. d. Kolk d. 1862; Conolly d. 1866.

by the continual dearth of the means of its development, should, if duly provided, expand into a large, honourable, and even universal department of medical work. The terms of engagement are to be more liberal; the clockwork is complete. But how is the practitioner to rise to higher standards of modern science and skill when no means of investigating disease or of making an intimate diagnosis are provided for him? He is well aware that the modern methods of medicine depend on such means as X rays, a battery of stains, and other cultural and biochemical apparatus; and not only an education in the use of these, but also the time to give to them. What should we think of a regiment of recruits called out to fight the enemy but unprovided with weapons or munitions? If the doctor be near a university centre he can get blood tested for morphological elements, or for sugar or nitrogen content, excretions analysed, bacterial examinations and vaccines made, and so forth; but it is imperative that these opportunities, now confined to a few, shall be universal. Moreover, if they are to be fruitful, the practitioner must consult personally with the scientist. These plants, then, and their staff must be established in all districts, together with a much larger provision of cottage hospitals. This university and its sisters are sending out every year bands of young graduates quite competent to deal with disease in all its forms, and to use refined means of diagnosis if these means are supplied. If not, how can we blame them if they fall into some stagnant routine? In district laboratories panel work would be paid by the Ministry of Health; for private practice a tariff of fees would be agreed upon.[9] A considerable sum for the commencement of these local centres was contained in the still-born Budget of 1914.

In the United States I am told that medical men are banding together in districts for such a development of their private practices. Five or six of them combine to rent a house with consulting rooms for each, and a common apartment for minor surgery, &c. Each member of the alliance—they are not exactly partners—is expected, in addition to his general practice, to take up special work in some department supplementary to the others; so that a fair variety of special skill may be available in the house; skill, if not of high expert value, which must still be sought elsewhere, yet quite sufficient for ordinary diagnosis and treatment. For this purpose visits of members to special clinics and ordinary holidays are mutually arranged. Patients like the system; they see that it is more thorough. Domiciliary visits become fewer, yet there is always one of the group on the spot. The fees are received by a secretary-attendant on the separate account of each member, and after all upkeep expenses are met the surplus is divided according to the credits of each. The individual earnings are higher than they were on the separate practices. Such are some of the material advantages; the spiritual are the disappearance of petty jealousies in a spirit of comradeship and a larger freedom for scientific and social life and for public service. The patients learn that a due remuneration of medical service is no longer gained by a multiplication of visits, nor by profits of dispensing.

These ends may no doubt be attained by different methods, but the essential need is the generally accessible laboratory and staff to be a little academy and place of reunion—a centre, let us say, for the meeting of the Divisions of this Association. But one word of caution: this centre must not be municipal, it must be free of all kinds of officialism, and kept alive by a small committee of local practitioners in alliance with the Insurance Commission.[10]

As regards the Voluntary Hospitals, I omit what I had written because the Report of the Consultative Council has covered a much larger ground, and so ably, that my passing reflections would be of little use. The dilemma between the lack of funds and the fear, almost an assurance, that public grants in aid would discourage private munificence, might, I think, be avoided if, on proof of efficiency, grants in aid were offered in some proportion to the amount raised by voluntary effort. To range up the Poor-law infirmaries with other hospitals and schools would enrich our clinical fields beyond all anticipation.

PREVENTIVE MEDICINE AND CLINICAL PRACTICE.

On the social mission of Public or Preventive Medicine, and on its integration with clinical practice, Sir George Newman and others of our leaders have said what is needful, better than I could say it. It is strange that not until the other day—so to speak—has the public awakened to its own needs in this matter, seeing that, at least from the seventh century before Christ and onwards, public health officers were appointed in the Greek countries. Yet 25 centuries later my old friend Dr. Warburton, of Pateley, wore out his life, and much of a good practice, by his not unsuccessful fight against enteric fever in the valley of the Nidd; and, thank God, he was but one devoted warrior among many. Let us remember, however, that the public has neglected science partly because science has neglected it. Now the medical service of the Panama Canal, and of the Great War,[11] by specific immunisation, brilliant sanitation, and modern methods such as the isolation of carriers, has brought medicine home not to each nation only, but to all men as an international and reforming influence. Of late years surgery has made our advances conspicuous, but inner medicine is coming again into her own; nay, they are one. From lesser to larger groups the standard of health must be more and more the guide and the signal of the nation, of the country, of the city, of the workshop; for public health is purchasable. If, by his invention of tools, Man has become the destroyer of creation, let Medicine show that tools can also be its saviour. Every righteous physician regards his practice as a social service, a means not only of bodily but also of social reconstruction, and of moral and intellectual health. Thus Medicine will become more and more a binding force in societies, a bond between nations, and a purification of the world.

Clinical Lecture

ON

FIBROIDS, LIPOMAS, DERMOIDS, AND POLYPI OF THE STOMACH AND INTESTINE.

Delivered at the Middlesex Hospital on April 22nd, 1920,

BY SIR JOHN BLAND-SUTTON, F.R.C.S. ENG.,
SURGEON TO THE HOSPITAL.

GENTLEMEN,—Fibroids are so common in the uterus you may easily imagine that this organ enjoys a monopoly of this kind of tumour. Experience teaches that tumours agreeing in naked-eye and microscopic characters with uterine fibroids grow from the muscular coat of the gastro-intestinal tract. There are two clinical varieties, subserous and submucous, and each usually occurs as a surprise in the operating theatre.

The specimen that prompted me to select this subject for the lecture was obtained from a spinster, aged 49, under my care in the hospital, and from whom I removed an ovarian cyst tightly impacted in the pelvis. The uterus, flattened over the anterior wall of the cyst, was otherwise normal. In the course of the operation a tumour the size and shape of a bantam's egg was seen on the cæcum, near the base of the vermiform appendix. This tumour could be described as sessile and subserous; at its junction with the cæcum there was a plexus of arterioles and venules resembling a nævus. Its removal was a simple affair. When hardened and bisected, the cut surface displays the usual whorled appearance so

[9] Since this address was written the valuable Report of the Consultative Council has been issued. I cannot well recast these paragraphs and must be content to welcome this Report and to express my agreement with it.

[10] Such a laboratory was built before the war at Wolverhampton, and as I had urged the institution of such centres I was honoured by a request to open it. It was, of course, held up during the war, but I hear it is now fully at work again and much frequented by the practitioners of the district.

[11] See Sir Douglas Haig's Despatch of December, 1917: "The preventive medicine man has saved his tens of thousands."

common in slow-growing hard fibroids of the uterus. It is in structure a fibromyoma. Clinically it was harmless.

In comparison with this a specimen preserved in the Museum of the Royal College of Surgeons of England may be studied. A fibroid similar in shape, size, and microscopical structure grew from the ileum, led to torsion of the gut, and set up symptoms of acute intestinal obstruction. An operation was performed, the tumour and the implicated section of the ileum were resected, but this failed to save the patient, a man aged 48.

This specimen illustrates the danger of a small heavy tumour hanging like a bob on the end of a loop of ileum, an ideal arrangement facilitating torsion of the gut. How tightly the gut may be twisted is shown in Fig. 1, for all the coats of the intestine, save the serous,

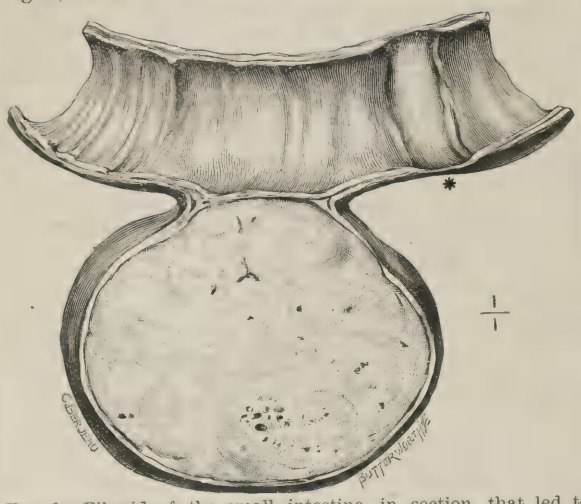

FIG. 1.—Fibroid of the small intestine, in section, that led to volvulus. * At this point all the coats of the gut, except the serous, yielded under torsion. From a man aged 48. (Museum, Royal College of Surgeons.)

have yielded, and the serous layer at the line of torsion is diaphanous. Many similar records can be gathered from periodical surgical literature.

The Museum of the University of Leeds has a specimen in which a pedunculated fibroid of the small intestine caused a volvulus of the whole of the small intestine. Such a comprehensive volvulus can only occur in those rare instances in which the whole of the small intestine, from the middle of the duodenum to the end of the colon, is slung on a common mesentery, an arrangement found in the human embryo which occasionally persists in the adult and predisposes him to this serious form of volvulus. I reported such a case in THE LANCET (1908, i., 1837). Intestinal fibroids are sometimes so big that they are mistaken clinically, in women, for uterine fibroids. A woman, aged 40, had a large hard tumour in the pelvis; in the course of the operation a pedunculated spherical fibroid, as big as two fists, was found connected with the pelvic (sigmoid) colon by a pedicle. The uterus was normal and smooth. The structure of the tumour was that of a myoma which had undergone mucoid degeneration. (Dujarier and Khan.)

Migratory Uterine Fibroids.

Gynæcologists have occasionally reported the occurrence of a subserous uterine fibroid that has detached its pedicle, which may have connected it with the uterus, and formed a new attachment to intestine or omentum. Fibroids supposed to behave in this way have been called migratory uterine fibroids. Improved knowledge relating to intestinal fibroids may lead to a revision of opinion in regard to this curious question, especially as a fibroid of the intestine weighing 7 lb. has been removed from a man, aged 40, in whom it produced intestinal obstruction (University College Museum). These examples illustrate, what observation of tumours throughout the body teaches—the baneful effects of simple tumours depend entirely on their environment. The size of a tumour does not offer a measure of its danger to life. A subserous fibroid occasionally grows from the stomach and reaches the size of a cocoanut; such a tumour merely produces uneasiness, but causes perplexity in diagnosis. A woman, aged 50, had signs indicating the presence of gall-stones, and a tumour the shape and size of a large pear; it could easily be moved about the abdomen in the neighbourhood of the gall-bladder. An operation revealed a large fibroid growing from the anterior wall of the stomach and an enlarged gall-bladder filled with stones. The tumour, which had been noticed many years, was coated with the white glistening cartilage-like tissue so common on chronic abdominal cysts and tumours long submitted to friction against the parietal wall. The gall-bladder and the tumour were removed. The latter proved to be a fibroid. Its removal involved resection of the wall of the stomach. This is almost invariably necessary with gastric fibroids. The patient was in good health six years after the operation.

Occasionally subserous fibroids of the stomach are large enough to reach as low as the hypogastrium; then the patient finds her way into the gynæcological department, where the tumour is almost invariably mistaken for an ovarian or a uterine fibroid, and serves to relieve the operative monotony engendered by specialism.

Uncomplicated fibroids of the stomach, like ovarian and uterine fibroids, are often passive tumours, but there are two stomachs in the Museum of Westminster Hospital which are exceptions to this rule. Each contains a pedunculated spherical tumour as big as a golf-ball growing within 5cm. of the pyloric orifice. A brownish-black depression on the tumour marks its summit like an umbilicus. In structure this spherical solid tumour is a fibromyoma. One of the stomachs was obtained from a woman, aged 50, who was admitted severely collapsed in consequence of hæmatemesis and melæna. She died three days after admission. The second specimen was obtained from a man, aged 37, who also died in similar circumstances. The clinical histories of these cases were published by Gossage and Braxton Hicks. Paterson regards this kind of gastric tumour as clinically a sarcoma. Fibroids of the stomach are not common tumours. Outland and Clendinning, in 1913, collected records of 79 examples.

FIG. 2.—Portion of jejunum in section: a pedunculated fibroid led to intussusception. P, pedicle; A, abscess; F, fibroid. From a man aged 35. (Museum, Middlesex Hospital.)

SUBMUCOUS INTESTINAL FIBROIDS.

A submucous fibroid of the intestine is invariably solitary, and as it projects into the lumen of the gut the propulsive efforts of the muscular coat relentlessly endeavour to extrude it. Sometimes the pedicle is lengthened, and in extremely rare instances snaps. Commonly, the persistent muscular contraction of

the gut drives the tumour forward and leads to intussusception, with all its attendant evils—intestinal obstruction, which, unrelieved, usually ends in death (Fig. 2). There are cases on record in which a tumour of the small intestine has caused intussusception, and the intussuscepted portion of the gut has sloughed and been voided at the anus. It is curious that in many such cases the cause of such intussusception has been a secondary deposit of malignant disease. The chances of an intussusceptum sloughing are so few that it is the rule to interfere surgically, and with promptitude. In many cases the surgeon has no idea that a polypus is the cause of the trouble until he has completed the operation; unravelling the strangulated intestine he finds, perhaps, a fibroid no bigger than a ripe grape.

Some of the most serious complications occur when the tumour grows in the wall of the ileum, a common situation, and the polypus, propelled through the ileo-cæcal valve into the cæcum, drags a segment of the ileum with it.

Sir D'Arcy Power operated on a boy, aged 5, for a chronic ileo-cæcal intussusception. It was necessary to resect the ileo-cæcal segment, as it resisted reduction. Three weeks later a lump as big as a walnut was noticed on the boy's chest near the right nipple; this was a round-celled sarcoma. On re-examination of the intussuscepted gut a small mushroom-shaped tumour was found in the ileum an inch above the valve. This tumour was responsible for the intussusception and had the microscopic characters of a round-celled sarcoma. Many cases have been reported in which secondary deposits of malignant tumours in the small intestine have induced intussusception.

Sarcomatous Fibroids.

It is admitted by histologists that in minute structure some uterine fibroids closely resemble spindle-celled sarcomas, and it is impossible to decide whether such tumours should be called sarcomas or fibromas. One way out of the difficulty is to call tumours of this kind sarcomatous fibroids. This is also true for intestinal fibroids. The piece of small intestine represented in Fig. 3 contains a tumour the size of a walnut. Shattock examined it critically and believes it to be a spindle-celled sarcoma with nuclei of striking size in many of the cells. It was successfully excised. In such cases the clinical course alone decides.

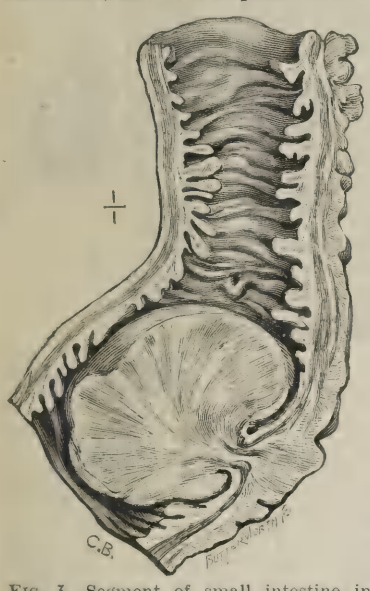

FIG. 3.—Segment of small intestine in vertical section containing a fibroid. Excised from a woman aged 45. (Museum of St. Thomas's Hospital.)

Intestinal fibroids, like uterine fibroids, often compromise the organ in which they arise:—

The subserous variety lead to volvulus (torsion) of the small intestine by their weight and movement, setting up acute and dangerous complications which often demand prompt and bold surgery.

Submucous fibroids of the intestine induce persistent propulsive movements in the muscular stratum of the gut, and these efforts almost invariably lead to intussusception, comparable to inversion of the uterus.

Intestinal fibroids are more dangerous than uterine fibroids, for they often cause obstruction, which is usually fatal unless relieved by surgical art.

Histologically they agree in the circumstance that the majority can be safely recognised as innocent tumours, but there are examples which cannot be distinguished from sarcomas.

INTESTINAL LIPOMAS.

Lipomas grow in the submucous tissue of the stomach and intestines—indeed, in any part of the alimentary canal from lips to anus—and are occasionally inimical to life. In the stomach small submucous lipomas the size of nuts have been described and are in the main pathological curiosities, but dangerous in the intestine. I found a submucous lipoma in the ascending colon, 5 cm. beyond the ileo-cæcal valve, in a man aged 44; he had had recurrent attacks of acute intestinal obstruction. The tumour, weighing 2 ounces, was successfully excised, and is preserved in the Museum of the Royal College of Surgeons of England. During the operation I noticed that the serous coat over the tumour showed a deep dimple, and the mucous membrane overlying the tumour was ulcerated. For a lipoma in a similar situation, in a woman, aged 31, Greenwood excised the cæcum and adjacent segment of the colon. The tumour is spherical, 4 cm. in diameter, and attached by a short pedicle to the wall of the colon. The mucous membrane covering the lipoma is ulcerated. The excised parts, with the tumour in situ, are preserved in the same Museum. Stabb operated on a man, aged 32, for intussusception of the ileum and found a submucous lipoma 75 cm. above the valve. He noticed a dimple in the serous coat overlying the tumour. The dimple suggests that the lipoma, though projecting into the gut, really arises in the subserous stratum of fat, and the dimpling of the serous coat is due to traction. This view is confirmed by a lipoma of the duodenum in the Birmingham Museum. It is a lobulated tumour depending from a pedicle 5 cm. long. Though the tumour lies within the bowel the serous coat is dragged in a little, and there is a small pit, or dimple, in the serous coat. The tumour clearly arose in the subserous tissue. The mucous membrane covering the tumour is ulcerated. The specimen was obtained from a dissecting-room subject.

The Museum of the Royal College of Surgeons contains a Meckel's diverticulum with a small lipoma apparently growing from the mucous membrane. The diverticulum had caused chronic obstruction; this led to an operation which ended fatally, but the lipoma was in no way responsible for the obstruction. The same collection contains a portion of the cæcum of a woman, aged 50, who suffered from constipation for many years. A lipoma grew within the folds of the ileo-cæcal valve, and the passage from ileum to cæcum is through a ring of fat covered with attenuated mucous membrane. It is a remarkable specimen. The cæcum was excised and the end of the ileum successfully anastomosed with the colon. (A. T. Compton, 1915.)

Lipomas, though simple and common, do occasionally destroy life; there is a submucous lipoma at the apex of an intussusception in the Leeds Museum.

DERMOIDS OF THE INTESTINE.

Dermoids are the rarest of all tumours that grow in the intestine. They have only been observed in the terminal segment of the large bowel. (Clutton, Danzel, and Port.) The Museum of the Middlesex Hospital contains an example growing from the posterior aspect of the rectum. It is as big as a walnut, and contains hair, grease, and a tooth, and was discovered post mortem. Several examples have been described growing from the mucous membrane of the rectum, and nearly all were found in women. The tumours are usually skin-clad and contain bone and teeth; in one of them, removed from a woman, aged 25, brain substance enclosed in a bony capsule was found. (Danzel.) The skin is usually pilose and the hair sometimes hangs in locks which extrude from the anus and cause annoyance. A pedunculated dermoid in the sigmoid flexure led to attack of intussusception in a girl aged 16. Clutton removed it and reported the clinical details in 1886.

Cystic dermoids occur in the rectum, and of this variety two examples are preserved in the Museum of St. Bartholomew's Hospital. One contains hair and a tooth; it was removed from beneath the rectal mucous membrane of a woman aged 39. The other, a multilocular cyst as big as a fist, contains hair. This dermoid was detached and extruded during labour. A careful examination showed no communication with the pelvic

cavity. (Souttar.) Small ovarian dermoids obstructing delivery have been forced through the walls of the rectum and extruded at the anus. This explanation does not apply to Souttar's case.

POLYPI (PAPILLOMAS AND ADENOMAS).

The term polypus is commonly applied to any pedunculated tumour in the stomach or the intestines; the name is merely of clinical use, and has no significance for the pathologist. Pedunculated tumours of the gastro-intestinal mucous membrane may be fibromas, lipomas, dermoids, adenomas, or papillomas. This section will be concerned with adenomas and papillomas. A simple form, shown in Fig. 4, resembles in shape a large ripe blackberry, hanging from the wall of the pelvic colon by a broad triangular band of mucous membrane. The head of the polypus is crowded with intestinal glands.

FIG. 4.—Solitary polypus of the pelvic (sigmoid) colon. The head of the polypus is crowded with intestinal glands. (Museum, Middlesex Hospital.)

Polypi may be solitary or multiple and sometimes exist in vast numbers on the gastro-intestinal mucous membrane from the termination of the gullet to the anus. They present themselves in various forms, some as flattened processes of mucous membrane beset with glands; many of the tags are long and narrow, others have club-shaped ends. Many are true warts and villous in appearance; occasionally they form clumps resembling cauliflowers. Often polypi and warts are attached by broad bases and so clustered together as to recall a colony of anemones on a rock. Such clumps and clusters of polypi are sources of danger as they favour the occurrence of intussusception. This is proved by an extraordinary set of specimens in the Museum of the Royal College of Surgeons, in which an abundant crop of glandular and papillomatous polypi grew from the mucous membrane of stomach, duodenum, jejunum, and ileum. The patient, a man aged 21, died after an operation for intussusception induced by a cluster of polypi in the jejunum. (W. Collier.)

There are reasons for believing that intestinal warts sometimes behave like cutaneous warts and disappear spontaneously. The most serious features in their clinical history are these: They simulate colic cancer, but are more chronic and set up recurrent attacks of pain, diarrhœa, and bleeding from the bowel, anæmia, and loss of weight. Diagnosis is established by the sigmoidoscope. Multiple papillomas are sometimes associated with cancer, and may be the forerunners of cancer. In these grave matters they agree with warts on mucous and cutaneous surfaces generally. An example of cancer of the œsophageal region of the stomach in association with multiple polypoid adenomas has been reported by Stewart (1913). The common age for intestinal papillomas is from the fifteenth to the thirty-fifth year.

Common situations for multiple polypi are the rectum and colon, especially the pelvic colon, and in this situation they are discoverable by the sigmoidoscope. In several instances long lengths of the colon have been successfully excised for this condition.

In the Middlesex Hospital (September, 1900) I excised from a German woman, aged 41, the whole of the pelvic colon (sigmoid flexure), which was crammed with luxuriant warts, set as closely as the bloom of a cauliflower. The lower end of the colon was closed with sutures and dropped into the pelvis, and the upper end implanted into the incision—permanent colostomy. She survived the operation eight years and died from intestinal obstruction caused by cancer.

In 1917 Ligat successfully excised the rectum and the colon as high as the splenic flexure from a man aged 36. It was beset with warts (Fig. 5). This man died two years later from acute pneumonia.

FIG. 5.—Cylinder of colon inverted to show multiple polypi. The mouths of the intestinal glands are conspicuous. Ligat's case. (Museum, Middlesex Hospital.)

Lockhart-Mummery excised, in 1918, the cæcum and colon (29 inches in all) from a spinster, aged 24, for multiple polypi, and joined the cut end of the ileum to the stump of the pelvic colon, and subsequently cleared the rectum of polypi with the aid of a sigmoidoscope. This woman was in satisfactory health two years afterwards.

Polypi are uncommon in the stomach. Breschet (1817) described one that grew from the mucous membrane near the œsophageal orifice and had a pedicle 6½ inches long; this allowed the head of the polypus to pass through the pylorus; it lay in the first part of the duodenum after death. The subject was a woman aged 69. Peter Thompson found a remarkable specimen in a woman, aged 75, a dissecting-room subject. A polypus that grew from the margin of the pylorus and adjacent part of the duodenum was involved in an intussusception which had dragged the pylorus and the first part of the duodenum into the second part of the duodenum. The mucous membrane covering the polypus contained gastric and duodenal glands.

Specimens of multiple polypi growing from the mucous membrane of the gastro-intestinal tract,

obtained in most instances from the post-mortem room, exist in all pathological museums. Surgeons are now supplying teaching collections with specimens obtained in the operating theatre. The value of such specimens is enhanced by complete clinical records and reports of microscopic examinations, without which many museum preparations are mere curiosities.

This lecture, in the main concerned with rarities, may be concluded with an example of a condition known as melanosis of the colon. Occasionally the mucous membrane of the large intestine from the ileo-cæcal valve to the anus is as black as ink. The specimen selected to illustrate this condition (Fig. 6) is an inverted

FIG. 6.—Cæcum and appendix turned inside out. The mucous membrane is charged with black pigment. From a woman aged 63. (Museum, Middlesex Hospital.)

cæcum with the vermiform appendix. The pigmentation begins sharply at the margin of the valve. In this instance the mucous membrane of the vermiform appendix is partially pigmented. Fortunately, the coloration is a curiosity and without sinister significance.

An instructive exhibition of fibroids, lipomas, and papillomas of the stomach and intestines was organised by Mr. Cyril Nitch and Mr. Herbert Paterson for the Surgical Section of the Royal Society of Medicine in May, 1920. The catalogue will be published in the Proceedings of the Society and should be useful to surgeons interested in the oncology of the gastro-intestinal tract.

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BONE-GRAFTING OF THE FRACTURED MANDIBLE.

WITH AN ACCOUNT OF SIXTY CASES.

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THE recent rapid progress in our knowledge of the bone-graft as a means of repair for the fractured mandible has been mainly due to the large number of such cases produced by the war. The transitory nature of this supply, and hence also of our opportunity for observing the results of surgical treatment, makes it desirable that accurate records should be kept of the results obtained by the methods so far attempted. I have, therefore, given as complete an account as space permits of the methods adopted and results obtained in all the cases with which I have so far dealt. In the pre- and post-operative dental treatment of these cases I have had the active coöperation of Mr. B. Mendleson, and the results obtained owe much to his judgment and skill.

Analysis of Results.

The cases now described are 60 in number. All but three are gunshot fractures and all were operated upon at the Queen's Hospital for Facial Injuries, Sidcup. They are consecutive and unselected cases, and represent all the bone-grafts I had done up to the end of 1919. In two cases the graft was lost owing to sepsis. Erysipelas accounted for one of these and a discharging ear, not noticed prior to operation, apparently accounted for the other. In one case sinus formation resulted in non-union, and the eventual absorption of the graft. This case has since been regrafted. In another case the graft, which extended from molar to molar region, is healthy and the wound soundly healed, but union has not yet occurred at either end. In the remaining 56 cases, 93 per cent. of the series, firm bony union has been obtained. 51 of the cases had edentulous posterior fragments, and in 40 of these the loss of bone involved the region of the angle. In 16 of the latter the loss involved the ascending ramus also.

General Principles of Technique and Treatment.

The graft was obtained from the crest of the ilium in all but the first two cases. This source has several advantages. The size of the graft is practically unlimited. All sclerosed and doubtful bone can, therefore, be freely removed from the jaw fragments. The soft and vascular nature of the iliac crest greatly facilitates the manipulation of the graft and its subsequent union and consolidation. Furthermore, it is possible by varying the position on the crest to obtain a graft of a general curvature suitable to each particular case. There is a complete absence of post-operative disability, even when the anterior superior spine has been removed with the graft. The cases were, as a rule, up and about 14 days after the operation, and in no instance has there been any complaint of the hip.

The aim, in every case, has been to obtain a sound carpentering junction between the graft and the jaw fragments, the bones being so trimmed that they fit end to end with accurate apposition of the largest obtainable areas of exposed vascular bone tissue. In this position they are firmly wired together. This technique was originally adopted in order to control the edentulous fragment and to facilitate early union by accurate and continuous apposition of opposed bone tissue. The technique has the additional advantage that it allows of the early exposure of the graft to the stresses incidental to muscular movement without risk of disturbing the close contact of bone tissue obtained at the time of operation. That this early stress is a factor in determining rapid union was only gradually recognised as a result of the impracticability, in the great majority of the cases dealt with, of obtaining rigid post-operative immobilisation by means of splinting. Where no teeth are present on the posterior fragment the rigid splinting of the larger tooth-bearing fragment to the upper jaw does not relieve the grafted area from all

muscular stress. Yet it was found that in over 60 per cent. of the successful cases union was of ivory hardness at the end of three to four months. In several of the cases, in which no effective control existed for either fragment from the time of the operation onwards, rapid bony union nevertheless resulted. (Case 50, Fig. 12, Cases 51 and 52.) Union was already fairly firm at the sixth or eighth week.

Experience has, therefore, led me to regard the chief rôle of the dental splint as being the maintenance of correct occlusion during the operation. The tendency to lingual deviation of the large fragment can be subsequently prevented by the interlocking of the splint when in closed bite or by means of a flange. The preponderance of edentulous fragments, far from being a stumbling block, was a factor in the success obtained, in that they prevented me from obtaining the rigid immobilisation I had proposed adopting as a routine measure. In order, however, that this early exposure of the grafted mandible to stress may be a factor in determining rapid union, it is important that it shall not involve any disturbance of the apposed bone tissue —that is, the "carpentering" at the time of the operation must be sound. A poor mechanical junction which allows of the subsequent movement of the bones upon one another will result in non-, or long-delayed, union unless rigid immobilisation by splinting can be obtained.

Pre-operative Treatment.

The interval between the original injury and the bone plastic has averaged 15 months. In some cases the period was considerably longer, while in a few a successful bone-graft operation was performed as early as five months after the injury. Pre-operative treatment has consisted in the elimination of sepsis, the extraction of teeth involved in the fracture or tending to cause malposition, the correction of the latter, and, finally, the immobilisation of the jaw fragments. At least three months has been allowed to elapse between the last visible indication of sepsis and the operation, and the same rule has applied to the extraction of teeth involved in the fracture.

The main factors producing malposition are defective dental occlusion, unopposed muscular action, and scar contraction. When both fragments bear teeth the usual deformity is a combined lingual roll and deviation, the free ends of the bones being drawn together, partly by muscular action, partly by scar contraction; while faulty occlusion of molar teeth has caused the fragments to rotate till the lower teeth may come to lie horizontally in the oral cavity. In the case of the toothless fragment the presence of teeth in the upper jaw impinging upon the gum causes the fragment to shift outwards into the cheek, in which position unopposed muscular action elevates it to the outside of the maxilla. As far as the tooth-bearing fragments are concerned, early splinting in correct occlusion will prevent these deformities. In the case of the edentulous fragment, however, this prolonged splinting of the opposite side has the effect of causing a progressive contracture of the unopposed muscles. Deformity can be equally well prevented by making the necessary dental extractions and then providing the toothed fragment with a flange to prevent lingual deviation. In cases treated in this way the toothless fragment shows little or no deviation and elevation. If these deformities are present it is to a relatively slight extent and readily overcome. (Mendleson.)

The inward roll, if markedly developed, cannot be corrected. The teeth may be used for splinting, and are then removed to prevent further deformity. The mesial approximation in the slighter cases can be corrected by continuous elastic traction. In severer cases, however, division of the intervening fibrous tissue and forcible separation are needed, a procedure which has so far invariably resulted in the mouth cavity being opened submentally.

In a few cases an effort was made to depress the edentulous fragment by means of a saddle carried as a detachable extension of the splint. Pressure ulceration was avoided by affixing the saddle very shortly before the operation, and removing it soon afterwards. This is liable to throw a heavy strain upon the graft. Moreover, the presence of a saddle at the time of operating prevents the complete exposure of the jaw stumps. (Fig. 13, Case 57.) The practice has been, therefore, to take the posterior fragment in its position of rest, however elevated, and to rely upon firm fixation to the graft for its post-operative control. One effective of this elevation, as Sir Frank Colyer has pointed out, is greatly to reduce the size of the gap to be filled by the bone-graft.

After previously acquired malposition has been, as far as possible, corrected, interlocking double "Gunning" splints are cemented on and bolted together in closed bite the day before the operation, and, in the majority of the cases, only removed from three to four months later.

Operative Technique.

The incision varies according to the position and extent of the fracture. For a loss of moderate extent in the region of the body of the mandible, it is placed well below the lower border of the jaw with a gentle convexity directed downwards. When the angle and ascending ramus are also involved, this incision is carried farther backwards below the ear, the convexity now being upwards. In this way an excellent approach is obtained to all parts of the ascending ramus, without risk of injury to the facial nerve. When the loss of bone extends farther forwards the incision is extended anteriorly with the same gentle sweep below the mandible and then, in the symphysis region, is carried sharply upwards, across the lower border of the jaw close to the middle line. In this way none of the depressor anguli oris branches of the facial nerve are caught, and a slight but nevertheless disfiguring palsy is thereby avoided. Fig. 1 shows this incision and its relation to the facial nerve and underlying mandible. In cases with a short symphysis loss, an adequate exposure is obtained by utilising the anterior portion of the above incision on either side; an inverted "Y" being produced, the stem of which lies in the middle line directly over the symphysis. For larger mesial losses a simple transverse incision is used, which passes horizontally across the neck, well below the lower border of the mandible on either side.

The jaw fragments are first exposed along their lower border and the soft parts separated from both surfaces with a raspatory, the length of bone exposed being determined by the extent of the obvious sclerosis. If teeth are present in the neighbourhood of the fracture, or if a saddle is in position on the posterior fragment, the exposure of the alveolar border is impossible, and extreme caution has then to be used in approaching this region. The oral cavity tends to pouch out between the fragments, often to a considerable extent, and as the tissue in this region is almost invariably scarred, it is wiser to leave a considerable mass projecting into the wound and shape the graft accordingly than to attempt too close an approach to the mouth cavity.

By means of gouge forceps[1] all sclerosed and doubtful bone is removed and the stumps suitably trimmed for fixation to the graft. They are then drilled as near as practicable to their upper border, care being taken to protect the deeper tissues lest the drill should enter the mouth, an accident which will render advisable the postponement of the operation. Pieces of tempered silver wire about 6 inches long are passed through each drill hole and their ends separately secured and held out of the way by forceps.

The fixation of the fragments in the case of the fractured mandible, due to the need for maintaining correct dental occlusion, accounts for much of the difficulty of bone-grafting in this region. Even in the case of the toothless posterior fragment the movement possible is a very limited one in an arc about the condyle. The graft has therefore to be cut accurately to fit the gap left between the jaw fragments on the completion of trimming. To facilitate this a piece of lead sheeting about 4 in. by 1 in., and stout enough to stand ordinary handling without distortion, is so cut and twisted that its ends lie evenly along the long diameter of the jaw "facets" and the sheet itself approaches these in a plane perpendicular to that of the facet. (Fig. 4.) This latter point is one of considerable importance, for it gives the plane of the short diameter of the facet, and thus enables the graft to be so cut that it is in accurate apposition throughout its thickness, and not merely along its outer edge, with the jaw fragments.

In the simpler type of case, when the jaw fragments lie more or less in the same plane, and their trimmed ends approximately face one another, the graft can be cut from the crest, shaped and drilled ready for wiring into the gap, with no other assistance than the lead template described above. When, however, the relation of the jaw fragments to one another is more complicated, it is impossible to cut the graft accurately by means of this template alone. In such cases a second or "check template" is used. (Fig. 5.) This is prepared from the first while the necessary transfer of the scene of operation to the hip is being arranged. In all essentials this second template constitutes a replica of the gap to be filled, the distance apart of the jaw fragments, the relative planes in which they lie, and the exact inclination of their trimmed ends to one another. The graft, cut with the aid of the first template, is placed against the check template. (Fig. 7.) If the fit is then found to be imperfect, the necessary alterations can be at once determined with an accuracy which would be wholly impossible were this test made in the wound itself.

In cutting the graft the template is so placed alongside the exposed crest that the future lower border of the graft corresponds to the free border of the crest, a portion of the latter being

[1] In the earlier cases I experimented with Albee's electrical saw, and with various types of hand saw, but none of these gave the precision of action, ease of manipulation, and freedom from injury to surrounding tissues which can be obtained by the use of gouge forceps. Chisels are contra-indicated on account of the risk of displacing the splints and of the strain they throw upon the teeth.

selected which possesses a curvature suitable to the particular case. A cut with the hand saw is then made across the crest, with an inclination in all directions corresponding to one end of the template. A steel strip is then slipped into the saw cut in order to facilitate holding the template, while a second cut is made in a position and at an angle corresponding to the other end of the template. (Fig. 6.) When, as is frequently the case, the two facets incline at an angle to one another, care has to be taken that the actual length of the graft is also correct. Fig. 6 shows the manner in which the template and steel strip are used in determining the plane for the second saw cut. The necessary measurement for the total length of the graft is indicated on both crest and template by a dotted line. The graft is now drilled at either end, the holes being placed close to the free border of the crest—that is to say, the future lower border of the graft. When it is not possible to use the whole thickness of the crest the latter is split with a chisel, the inner or outer portion alone being used. The graft is now removed with chisel and mallet. As this division determines the shape of its upper border regard must be paid to the amount of tissue to be accommodated between the jaw fragments. Throughout the cutting and drilling of the graft the latter remains attached to the ilium. Only when it is ready to be wired into position is it severed from the latter. The manipulation of the graft and the time occupied in the transfer to its final position are thus reduced to a minimum.

When the fracture involves the angle the posterior fragment, although thin, is often of considerable vertical extent, a narrow and elongated facet for apposition to the graft being the result. The latter is cut accurately to fit this elongated facet and the soft medullary tissue lightly gouged out so as to form a long and shallow groove (Fig. 8), into which the thin posterior fragment fits, embraced on either side by the slightly projecting compact bone of the graft. In this position the wiring holds the fragments beyond all possibility of subsequent displacement.

When the fracture involves the ascending ramus the atrophy seen in the region of the angle becomes more marked. The higher the loss extends, and the longer the period which has elapsed since the original injury, the thinner and more brittle the bone that is left. Fig. 9 (Case 30) shows an adaptation of the foregoing technique for dealing with such a condition.

When the loss extends anteriorly into or beyond the canine region it is impossible, owing to the curvature of the jaw, so to trim the fragment that the facet for apposition with the graft looks even approximately towards the posterior fragment. The more anteriorly the loss extends, the more does the trimmed end of the jaw tend to face outwards. The sclerosis, which is always a marked feature of the anterior fragment, owing to the obliteration of its nutrient artery in the infra-dental canal, invariably extends further along the lower border of the bone than elsewhere. The effort to remove all trace of this condition usually results in the trimmed surface of the jaw stump facing obliquely downwards as well as outwards. (Fig. 10.) Fig. 2 shows the mode of cutting the graft in order to obtain a facet of sufficient breadth in this position. The anterior superior spine is exposed and an oblique saw cut through this, in a plane determined by the template, gives the facet for apposition with the anterior fragment.

In cases of extensive mesial loss involving not only the symphysis region but also part of each horizontal ramus, it is difficult to obtain a sufficient "bow" on the graft to accommodate the considerable mass of tissue intervening between the two jaw stumps, and to carry the chin and dentures out to anything like their normal position. A further difficulty is due to the inward rotation of the fragments. The first difficulty is surmounted by taking the whole of the anterior superior spine with the graft, the spine being retained or removed according to individual cosmetic requirements. (Fig. 3.) The second difficulty is got over by making the ends of the grafts correspond, the one with the thickening found at the junction of the middle and anterior thirds of the crest, and the other with the thickened bone lying directly above the anterior inferior spine. In this way broad areas are obtained at either end of the graft, and although the long axis of these facets cross those of the jaw facets often almost at a right angle, a very considerable area of vascular bone tissue remains in apposition.

The trimmed and drilled graft, on removal from the crest, is tested against the check template and at once transferred to the jaw wound. The wires, issuing from the deep aspects of the jaw fragments, are threaded through the corresponding holes in the graft and the latter slid down into position between the jaw fragments. If the technique has been successfully carried out the fit should be good, and no further alteration or adjustment needed. The graft is held firmly in position while the wires are given two or three turns upon one another and the ends cut short. No care has been taken to preserve the periosteum of the graft or of the jaw fragments, nor is any attempt now made to bring periosteum over the junction. Great care must, however, be taken that neither periosteum nor other soft tissue is allowed to intervene between

TABULAR ANALYSIS OF THE SERIES OF GRAFTED MANDIBLES.

Cases.	Months between inj. & op.	Nature of union obtained.	Weeks after op.	Loss of bone.	Teeth in post. frag.	Remarks.
1	24	Bony.	40	M 1 to Pm 1.	0	Pedicle slide graft.
2	10	,,	24	M 2 to C.	0	Osteo-periosteal from tibia.
3	8	,,	25	A to Pm 1.	0	This and all remaining cases were free grafts from ilium.
4	16	,,	31	A to Pm 1.	0	Very faint spring at 17 wks., patient "eating anything."
5	10	,,	24	A to M 1.	0	Union probably earlier.
6	16	,,	24	As R to C.	0	Faint spring only at 12 wks.
7	16	,,	27	A to Pm 1.	0	,, ,,
8	18	,,	23	M to Pm.	0	No earlier observation.
9	6	,,	21	Pm 1 to I 1.	2	On removal of splints.
10	9	,,	24	As R to Pm.	0	,, ,,
11	5	,,	21	As R to C.	0	,, ,,
12	12	,,	16	A to Pm 2.	0	,, ,,
13	12	,,	18	A to Pm 2.	0	,, ,,
14	4½	,,	20	A to C.	0	,, ,,
15	14	,,	15	Pm 2 to I.	0	,, ,,
16	12	,,	25	As R to M 1.	0	Greater part graft removed as sequestrum 4 wks. after op. Firm union; all sepsis disappeared.
17	7	None.	—	As R to M.	0	Sinus formation and graft absorbing. Since regrafted.
18	17	Bony.	15	A to C.	0	On removal of splints.
19	6	,,	14	M to I.	1	,, ,,
20	14	,,	18	As R to Pm.	0	Double rib-graft at Millbank, November, 1918.†
21	8	—*	—	M to Pm.	0	Erysipelas shortly after op. Graft infected and removed.
22	25	Bony.	21	Pm.	1	Due to blow from rifle.
23	8	,,	17	A to Pm.	0	Due to fall. Union on removal of splints.
24	7	,,	15	As R to C.	0	On removal of splints.
25	7	,,	9	A to Pm.	0	Sinus over graft ceased discharging some time after union.
26	15	,,	12	A to Pm.	0	On removal of splints.
27	24	,,	10	M to I.	1	,, ,,
28	13	,,	27	As R to C.	0	Slight spring on removal of splints.
29	35	None.	—	l. M 1 to r. M 3.	1	Soundly healed, spring still present both ends.
30	21	Bony.	24	As R to C.	0	Union at ant. end in 11 wks.‡
31	10	,,	14	A to C.	0	On removal of splints.
32	14	,,	13	M 2 to Op I.	1	,, ,,
33	10	,,	20	As R to Pm	0	,, ,,
34	19	,,	14	As R to Pm	0	,, ,,
35	10	,,	42	As R to Pm	0	Loss of asc. ramus almost to sig. notch. Splinted in open gap owing to edent. upper jaw. Much loss of skin, wound gaped, sepsis followed, loss of greater part of graft as sequestrum.
36	14	Bony	42	A to Pm.	0	Mouth entered during op.; sinus formation and delayed union.
37	8	,,	12	A to Pm.	0	On removal of splints.
38	22	,,	17	M to M.	2 r. 1 l.	,, ,,
39	12	,,	15	M to I.	1	,, ,,
40	14	,,	15	M to C.	0	Ivory union on removal of splints. Aged 38, looked older.
41	16	,,	19	A to Pm.	0	Pedicle slide regrafted from ilium.
42	15	,,	—	Pm to C.	1	Fragments separated 3 mths. prior to op.; submental drainage to oral cavity resulted; sinus formation; delayed union.
43	53	,,	17	A to Pm.	0	On removal of splints.
44	16	,,	—	A to Pm.	0	Firm union post. in 8 wks., ant. fragment sclerosed. Resulting non-union has been regrafted (Fig. 11).
45	10	,,	14	As R to M 1.	0	On removal of splints.
46	12	Slight spring.	14	As R to C.	0	Eating ordinary food; cracks nuts without discomfort.
47	15	Bony.	12	C to C.	—	On removal of splints. Teeth present.
48	17	,,	21	M to Op C.	0	Faint spring on removing splints.
49	12	,,	11	A to Pm.	0	On removal of splints.
50	16	,,	17	Pm 3 to Pm 3.	1 r. 1 l.	Splints loose from op. onwards; removed at 8th wk. Very faint spring then present.
51	12	,,	11	A to Pm.	0	On removal of splints. Splints opened; eating soft food from 6th wk.
52	22	,,	14	M to M.	0	No teeth on lower jaw.
53	25	—*	—	A to I 2.	0	Copious discharge 2 days after op. Suppurating ear not noticed previous to op.
54	18	Bony.	20	Pm to Op I.	1 M.	Attempt to approx. and plate fragments (at Millbank) had failed owing to sepsis.
55	32	,,	16	A to C.	0	On removal of splints.
56	11	,,	12	Pm to Pm.	—	On removal of splints. Teeth present.
57	14	,,	14	M to C.	0	On removal of splints.
58	28	,,	15	As R to C.	0	Loss of skin over fracture made good by pedicle flap from neck prior to op.¶
59	16	,,	12	Pm to Op C.	0	Slight spring only at 10 wks. Splints then left open.
60	40	,,	16	As R to C.	0	On removal of splints.

—* Graft lost. † Right graft lost owing to sepsis. ‡ Rib B.G. attempted at Millbank and removed 24.5.18. ¶ Two previous attempts (both at King George's), first from tibia, second from iliac crest, failed owing to sepsis.

A, angle. As R, ascending ramus. I, incisor. C, canine. Pm, premolar. M, molar. r, right. l, left.

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

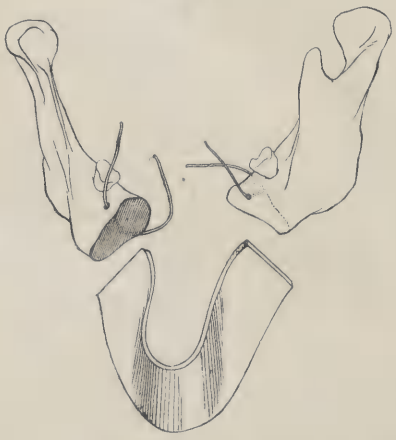


FIG. 5.

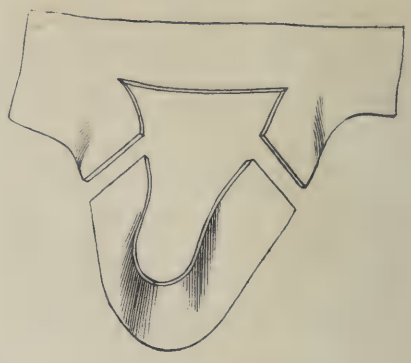


FIG. 6.

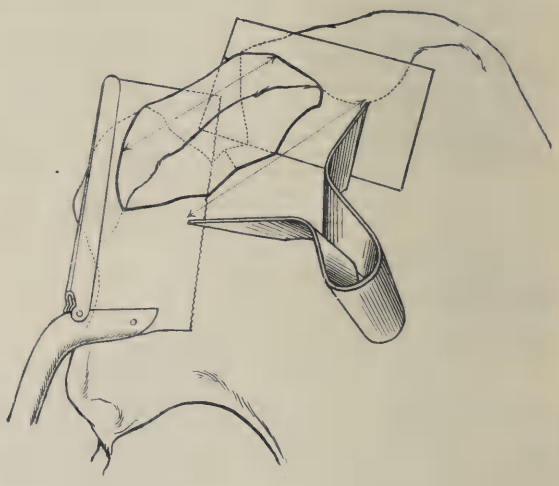


FIG. 7.

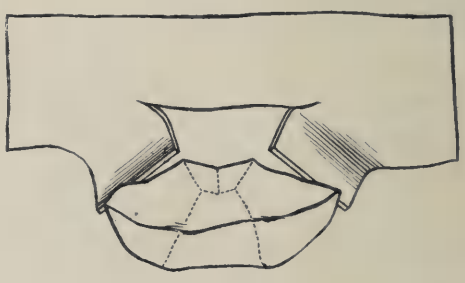


FIG. 8.

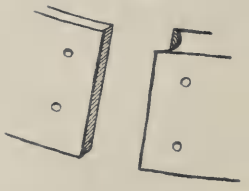


FIG. 9.

For descriptions of Figures see opposite page.

FIG. 10 (Case 25).

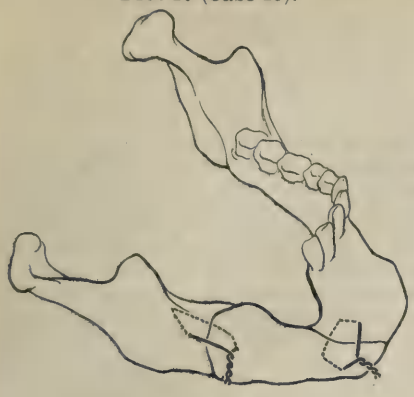


FIG. 11 (Case 44).

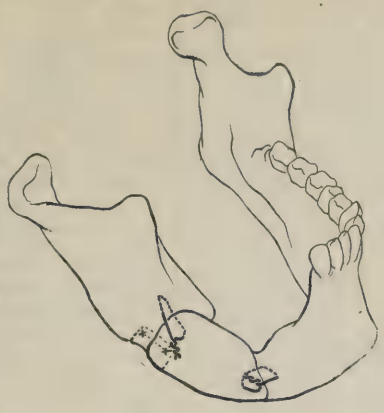


FIG 12 (Case 50).

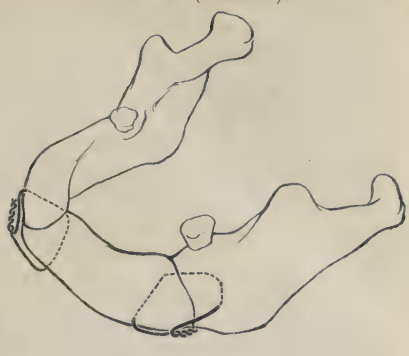


FIG. 1.—Diagram showing the relation of the incision to the branches of the facial nerve and the underlying mandible.

FIG. 2.—Portion of ilium utilised when the facet on the anterior fragment is in the canine region, and unavoidably trimmed to face downwards and outwards. The corresponding facet on the graft is obtained by the oblique saw-cut through the anterior superior spine seen on the left of the diagram.

FIG. 3.—Portion of ilium utilised for extensive mesial loss. Considerable "bowing" can thus be obtained, while the thickened region at either end allows a considerable area of opened bone tissue to be in apposition with the trimmed end of either ramus.

FIG. 4.—The lead "template," showing the manner in which it records the relationship of the trimmed jaw stumps to one another.

FIG. 5.—The same template as in Fig. 4 and the "check template" made from it.

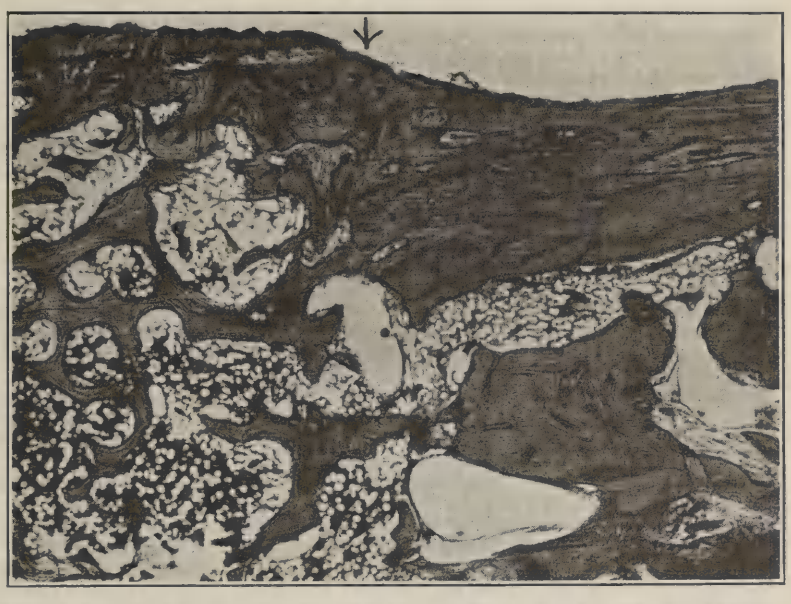
FIG. 6.—Mode of using the template. The graft to be cut is outlined as a transparency. A sheet of thin steel has been slipped into the saw-cut on the right, and against this one end of the template is being held. The saw is shown in position in the second cut, its direction being determined by the other end of the template.

FIG. 7.—Mode of testing graft against the check template.

FIG. 8.—Mode of trimming the thicker graft to embrace the thin posterior fragment.

FIG. 9.—A modification of this technique for very small posterior fragments—e.g., Case 30.

FIG. 11A.



Microphotograph of the area X.....X in Fig. 11 (× 15). The section shows the line of junction between graft (left) and post fragment of jaw (right) six months after operation. A continuous layer of compact bone passes from the surface of the thinner jaw fragment to that of the thicker graft. There is a sudden transition from the compact structure of the jaw to the cancellous structure of the graft, no intermediate zone being present. There is no sign of absorption and redeposition in the graft. The arrow placed above the section marks the line of junction.

FIG. 13 (Case 57).

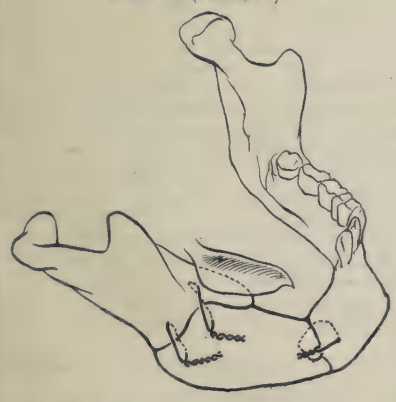
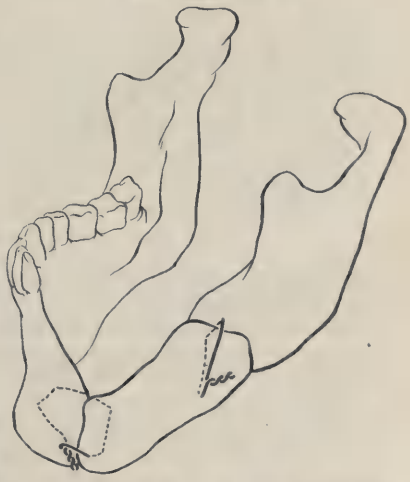


FIG. 14 (Case 28).

FIG. 15 (Case 24).



FIGS. 10, 11, 12, 13, 14, and 15 are semi-diagrammatic reconstructions of some of the grafted mandibles. They have been made for me by Mr. Hornswick from information supplied by radiograms, some of them stereoscopic, and by the lead templates. The size and position of the graft and jaw fragments are correct and follow as closely as possible the radiograms; the Mercator-like projection of the more outlying parts of the photograph has, however, been eliminated. The diagrams show the character of the "carpentering" employed, but do not show the nature of the union obtained.

the apposed bone surfaces. In no case has it been possible to attribute sepsis to the presence of the wire, and successive radiographs entirely fail to suggest that the wire in any way inhibits bone formation.

The wound is closed, when practicable, in two layers, deeper tissues, muscle, fascia, or maxillary gland being all drawn together over the graft with deep catgut sutures, not merely to serve as an additional covering between this and the skin flap, but also, and mainly indeed, in order to obliterate all spaces round the graft. The closed incision is finally painted over with tinct. benzoin. No dressing or drainage-tube is used. A careful watch is, however, kept for the first few days, and any serum or blood collecting is drawn off through a small opening by means of a Bier's suction glass; this process being repeated, if necessary, on successive days.

Permanence and Functional Value of the Grafted Mandible.

The permanent character of the repair effected by the bone-graft can only be determined by the lapse of time. In some of the cases in the present series more than a year has elapsed since the operation, and the only change shown in successive radiographs is one of progressive consolidation. In Case 44 a fibrous union had resulted owing to failure to remove all the sclerosed tissue from the anterior fragment. At the operation for resecting and regrafting this non-union, six months after the original operation, the posterior union, which had been firm clinically since the splints were removed, was represented by a faint rounded ridge where the thicker graft passed into the thinner posterior fragment. Both the graft and the ridge marking the line of union showed a hard smooth surface exactly resembling that of the adjacent jaw fragment. A small piece, indicated by dotted lines in Fig. 11, was resected for examination. During its removal the vascularity of the graft was found to be in every way as good as that of the adjacent jaw fragment. A microphotograph of a section of this fragment in the direction of the line X.....X is seen in Fig. 11 A. This section is in complete agreement with the X ray appearance presented by the union in other cases. It is often possible to recognise the uninterrupted passage of the bone architecture of the graft into that of the mandible. This is particularly striking when viewed stereoscopically and stands in sharp contrast to the fibrous union, however firm this may be clinically. In Case 26 this contrast is seen side by side on the same horizontal ramus. The radiograph shows the spontaneous union as a white line of fibrous tissue which has undergone no change in appearance. The graft, on the other hand, has merged so completely with the mandible that it is difficult to see exactly where the original junction was situated.

In determining the subsequent functional value of the grafted mandible there are several factors to be taken into account, besides the permanent character of the graft and its bony union. The prolonged disuse results in a weakness of the muscles of mastication and the same cause greatly increases the normal periodontal sensitiveness. That these, however, are not permanent conditions is shown by the nature of the diet of some of the patients within a few months of the operation. By the method adopted for obtaining the graft, the upper or alveolar border is constituted by open cancellous tissue. Successive radiographs show that under the influence of the stress and strain to which the graft is subjected in the normal use of the jaw the architectural structure becomes modified in accordance with Wolff's law, and a compact layer of bone is formed completely encircling the central tissues of the graft. In several cases I have found the graft able to bear directly the pressure of a denture within a few months of the operation.

The Fate of the Free Graft.

General opinion is, on the whole, tending towards the view that the free graft remains alive and takes an active osteo-genetic share in the union. The graft, with its thin tables of compact bone, is relatively more transparent in the earlier post-operative radiographs than is the far denser mandible. There is, however, no constant post-operative increase in this relative transparency. On the contrary, successive radiographs show a uniform increase in the opacity of the graft. The small area of vascular tissue exposed in the case of many of the posterior fragments, and the dense and relatively avascular nature of the anterior fragment, taken in conjunction with the large size of many of the grafts, make it very difficult to imagine that the latter owes its rapid consolidation, wholly, or even mainly, to invasion and replacement by osteogenetic tissue from the mandible. The behaviour of the graft in the presence of sepsis is even more suggestive. In Case 16, in which the graft was of considerable size, there was extensive suppuration after the operation. A month later a large sequestrum came away. Union nevertheless occurred at both ends, and a subsequent radiograph shows the upper or alveolar border of the graft, together with the whole of its anterior portion, still in position and firmly united at either end. All sepsis has since disappeared, and the final result is excellent. That we are not dealing with an involucrum is, I think, shown by the appearance of the anterior end of the graft, with its close fit to the jaw fragment and the wiring still in position. The view that the sequestrum was thrown off by the living graft is supported by three other cases in which small sinuses over the graft closed after the separation of one or more small sequestra from the latter, without leading to its infection, or in any way interfering with the progress of union. In one case sepsis has resulted in the infection of the graft. The appearance of this case, with the entire absence of any attempt at union and the irregular rarefaction of the graft, stands in striking contrast to that of the other cases.

I have only seen one case in which dead bone, a boiled autogenous graft, was used. The graft remained sterile and the wound healed by first intention. Months afterwards, however, there was still no trace of union, or of any invasion of the graft by bone tissue from the jaw fragments, and successive radiographs unmistakably show the graft undergoing progressive absorption.

Summary.

The series consists of 60 consecutive cases of bone-grafted mandibles. Of these all but two were free autogenous grafts from the ilium. 51 possessed edentulous posterior fragments and in 40 of these the loss involved the region of the angle. In 16 of the latter the loss involved the ascending ramus also. Firm bony union was obtained in 56 of the cases, 93 per cent. of the series.

The graft and jaw fragments were so trimmed as to fit accurately end to end, with the largest obtainable areas of exposed vascular bone tissue held in close contact by firm wiring. The close apposition results in early bony union, while the firm fixation allows of the bones being subjected at once to some degree of muscular strain without fear of displacement, thus leading to the early consolidation of the primary union. In over 60 per cent. of the successful cases the union was of ivory hardness on the final removal of the splints, three to four months after operation.

Note.—The favourable influence of early exposure to stress is strikingly shown by seven cases grafted while the above paper was in the press. The splints in each case were removed in the second or third week, and in one case within three days of the operation, a flange being fitted to prevent lateral strain upon the graft. Four of these cases were firmly united within the month, and the remaining three were firm before the end of the third month. In two cases in which union was secured within the first month a previous bone graft (not by the author) had been attempted and failed. In one of these the loss involved the greater part of the ascending ramus. In only one case did the posterior fragment bear teeth, one molar tooth being present on each fragment. The splints in this case were, however, loose from the time of the operation onwards. In one case no teeth were present on either fragment, and there were only two teeth in the upper jaw.

PORTSMOUTH AND SOUTHERN COUNTIES EYE AND EAR HOSPITAL.—At the annual meeting of this hospital held in the Town Hall, Portsmouth, on June 24th, it was reported that the new wing erected in 1914 had been paid for. The general financial position was one for anxiety. There was a decrease in the current revenue, a deficit on the year's work of £398, and a bank overdraft of £751.

THE PARATYPHOID "C" BACILLUS AS A CAUSE OF PARATYPHOID FEVER.

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(*Bacteriological Investigations in Macedonia, 1916–17–18.*)

IN 1916 Professor Ludwig Hirschfeld, bacteriologist-in-chief to the Royal Serbian Army, isolated by blood culture a bacillus which, for reasons about to be defined, he labelled "Paratyphoid C." The patients from whom the organism was cultivated were suffering from "enterica," but no known bacillus of the enterica group was isolated and no serological confirmation was obtained. Professor Hirschfeld considered that the organism was distinct from the known paratyphoid bacilli isolated from the Serbian soldiers suffering from enterica, and he decided to add this bacillus to his preventive vaccine. In December, 1916, a vaccine was prepared in his laboratory at Sedes which contained *B. typhosus* and paratyphoid bacilli A, B, and C, and *V. choleræ*. This vaccine was employed in the Serbian army for preventive inoculation in 1916, 1917, and 1918. In December, 1916, a bacillus was obtained by blood culture from a Serbian soldier at an Anglo-Serbian hospital suffering from enterica, and as it was found to be atypical it was sent to one of us (L. S. D.) for further investigation. This organism proved to be a strain of the para. C bacillus. An antiserum which was prepared with this strain of para. C corresponded to the para. C antiserum supplied to us by Professor Hirschfeld, and the organisms were in all respects similar.

It was decided to prepare a para. C antigen for the laboratories in Macedonia similar to those employed for the typhoid and paratyphoid A and B reactions at the Central Laboratory, and also a supply of para. C antiserum. At subsequent periods this organism was isolated by blood culture from Serbian soldiers (6) in Anglo-Serbian hospitals, and further strains were obtained from the fæces of Serbs and others (10) who were suffering from severe diarrhœa or enterica. The organism was not isolated by us or our co-workers from the urinary tract. It is now known that, in addition to typical enterica, the *B. paratyphosus C* may give rise to infective conditions, such as severe diarrhœa, broncho-pneumonia, and general sepsis.

Castellani,[1] in an article on typhoid infections in the "Adriatic-Balkan Area," refers to a number of "atypical or mixed enterica infections." He states that six strains were isolated with the cultural characteristics of the *B. paratyphosus B*, but serologically distinct, and three strains culturally similar to the paratyphosus A, although distinct serologically.

Archibald, Hadfield, Logan, and Campbell,[2] in their report on the diseases affecting the troops in the Dardanelles, state that out of 147 cases of enterica, 21 were due to *B. typhosus*, 41 to *B. paratyphosus B*, and 70 to *B. paratyphosus A*, while 15 inagglutinable para. A strains and 14 para. B were also obtained.

Kennedy,[3] in an article in the *Journal of the R.A.M.C.*, reports that in 1914 at the Enteric Convalescent Depôt at Naini Tal he found five inagglutinable strains by blood culture, resembling *B. paratyphosus A* or *B.*

Macadam,[5] Mackie and Bowen[4] isolated a bacillus in Mesopotamia which appears to be identical with the *B. paratyphosus C* of Hirschfeld. Macadam[5] isolated this bacillus from 7 cases by blood culture, and on 2 occasions post mortem (1 from lung and 1 from bile).

Mackie and Bowen[4] isolated the para. C bacillus from 12 cases, 10 from the blood stream, 1 from the urine, and 1 from the liver. The authors state that the paratyphoid C bacillus does agglutinate with some samples of antiparatyphoid B serum to low titre, and also that the para. B co-agglutinins are removed from the para. C antiserum by the para. C bacillus. Macadam noted on several occasions zones of inhibition of agglutination with the para. C reaction. Neukirch[6] while working with the German Army refers to his findings in Turkey. He cultivated from the blood, urine, and fæces, bacilli allied to the paratyphoid B. bacillus, but serologically distinct. Although he does not give the name para. C to these organisms, it is probable from his results that some of his strains were identical with the bacillus of Hirschfeld. On clinical evidence some of the cases were typical enterica, others were dysenteric in character. Dienes and Wagner[7] also obtained similar findings to those recorded by Neukirch.

Garrow[8] has published a case recently of a paratyphoid C infection which occurred in East Africa. The patient presented the clinical features of a typical enterica infection. The paratyphoid C bacillus was recovered from the blood stream and the patient's serum contained specific agglutinins for this organism. No paratyphoid B agglutinins were present.

Fatal Cases.

We were able to obtain details of two cases of fatal para. C infection in the Balkans, although other cases no doubt occurred.

CASE 1.—Macedonian labourer. Investigated by Captain J. Anderson, R.A.M.C. *B. paratyphosus C* was isolated by blood culture from this patient who was profoundly ill with "enterica," and subsequently died. At the autopsy the spleen was found to be much enlarged, very soft, and congested. There was no intestinal ulceration, but marked patchy congestion of the intestinal wall.

CASE 2.—A Macedonian woman was admitted to hospital at Vodena, and died on the eighteenth day after a severe illness. This patient was diagnosed clinically as enterica. No malarial parasites were found in the blood film, and the cerebro-spinal fluid was normal in all respects. An agglutination reaction on the thirteenth day of the disease gave a $\frac{50}{5000}$ reaction to para. C, while two days later it reached $\frac{125}{5000}$, but no reaction occurred with the typhoid, para. A, or para. B antigens. No further observations were possible, as the patient was many miles away from a British unit.

Agglutination Reactions Obtained in Macedonia.

Captain Anderson, bacteriologist to an Anglo-Serbian Hospital, made the following observations:—

He examined the blood of 104 patients for evidence of typhoid and paratyphoid A, B, and C agglutinins with the antigens supplied by us. Of these patients, 11 were British, 9 French, 58 Serbians, and the remainder included the "mixed bag" of people met with in the Balkans.

Only 2 out of a total of 58 Serbians gave a reaction to the para. C antigen. In the first case the Serb had been inoculated against the enterica group one month previously with Hirschfeld's mixed vaccine and gave a reaction of $\frac{50}{5000}$ for para. C, $\frac{50}{15000}$ for typhoid, and $\frac{50}{10000}$ for para. A, but no para. B reaction. In the second case the Serbian soldier had been inoculated against the enterica group one year previously, and showed a $\frac{25}{5000}$ reaction to para. C, a slightly greater typhoid and paratyphoid B reaction, but none to para. A. Further, although 8 cases gave a reaction of 1 in 100 or over with our typhoid antigen, and one case to $\frac{1500}{8000}$ with the para. B, there was no reaction at the lowest limit with the para. C antigen.[9]

To elucidate further the question of degree of response to the para. C portion of the quadruple vaccine this organism was embodied in the vaccine to be employed for the inoculation of 20 volunteers amongst the Bulgar prisoners, while the remainder received the triple vaccine. The blood of each man was tested for his agglutination response to typhoid, and para. A, B, and C before inoculation, and again ten days later. The local and general effects of the quadruple vaccine were considerable in many cases, while in all a definite local reaction occurred. In five cases pyrexia exceeded 100° F. on the second day after the inoculation, but in two of these men it was probably malarial in origin.

[1] Castellani: Typhoid and Allied Infections in the Adriatic-Balkan Area, Ann. Med. Nav. and Colon., 1916, November-December, vol. ii., pp. 453–461.

[2] Archibald, R. G., Hadfield, G., Logan, W., and Campbell, W.: Reports on the M. and H. Laboratories, dealing with the diseases affecting the troops in the Dardanelles, R.A.M.C. Journal, June, 1916, vol. xxvi., pp. 695–724.

[3] Kennedy, J. A., Lieutenant-Colonel, R.A.M.C.: Inagglutinable Paratyphoid Bacilli (Paratyphoid C) in India, R.A.M.C. Journal, August, 1918, vol. xxxiii., p. 190.

[4] Mackie, F. P., Major, R.A.M.C., and Bowen, G. T., Captain, R.A.M.C.: Note on the Characters of an Anomalous Member of the Paratyphoid Group met with in Mesopotamia, R.A.M.C. Journal, August, 1919.

[5] Macadam, W.: An Account of an Infection in Mesopotamia due to a Bacillus of the Gaertner Paratyphoid Group, R.A.M.C. Journal, August, 1919.

[6] Neukirch, Paul: Uber Menschliche Erkanshungen derch Bazillen der Glasser-Voldagsengruppe in der Turkie, Zeitsch. für Hygiene und Infektions, 1918.

[7] Dienes, L., und Wagner, Richard: Über Paratyphus B-infektionen, Zeitsch. für Hygiene und Infektionskr., 1918.

[8] Garrow, R. P.: A Case of Paratyphoid "C" Fever in East Africa. THE LANCET, June 5th, 1920.

[9] It is a matter of considerable difficulty to obtain reliable information concerning preventive inoculation among the Serbian soldiers.

In every instance enlargement and tenderness of the axillary glands occurred.

Agglutination Response.

It will be seen from Table I. that of the 20 Bulgars whose blood was tested before inoculation 10 gave a $\frac{50}{15000}$ reaction to the typhoid antigen, and 1 a $\frac{100}{15000}$, while only 3 reacted to the para. A antigen, one of them to the extent of $\frac{200}{10000}$. No reaction occurred with the para. B antigen, and in only one instance with the paratyphoid C. The agglutination response, therefore, to the paratyphoid antigens was feeble or entirely absent. No evidence was obtainable as to whether these men had been inoculated previously with a triple vaccine, although they had received a typhoid vaccine some months previously.

The inoculation of our quadruple vaccine excited an active response to the T. A and B antigens, but a C reaction occurred in only one instance (Case 2); here a reaction of $\frac{50}{5000}$ was obtained before inoculation, which rose to $\frac{100}{5000}$ ten days after the injection of the vaccine. In two instances a B reaction of $\frac{1000}{8000}$ was produced, but no C reaction was obtained.

The same strain of para. C bacillus was employed for the preparation of the vaccine and antigen.

TABLE I.—*Agglutination Response to One Dose of Quadruple Vaccine in Bulgarian Soldiers.*

Case.	Agglutinin response before inoculation.				Agglutinin response 10 days after inoculation.			
	T.	A	B	C	T.	A	B	C
1	50	0	0	0	200	100	0	0
2	50	200	0	50	50	300	0	100
3	0	0	0	0	100	100	50	0
4	100	0	0	0	100	100	50	0
5	50	50	0	0	50	100	50	0
6	0	0	0	0	50	50	0	0
7	0	0	0	0	200	50	50	0
8	0	0	0	0	—	—	—	—
9	50	0	0	0	50	100	0	0
10	0	0	0	0	0	50	100	0
11	50	0	0	0	100	100	0	0
12	50	0	0	0	200	100	0	0
13	0	0	0	0	100	100	50	0
14	0	0	0	0	100	100	200	0
15	0	0	0	0	100	50	1000	0
16	50	0	0	0	200	50	100	0
17	0	0	0	0	50	50	50	0
18	50	0	0	0	50	50	200	0
19	50	0	0	0	50	50	50	0
20	50	50	0	0	200	200	1000	0

End-point of antigens, typhoid, 15,000; A, 10,000; B, 8000; C, 5000.
Note: 0 = 1/25, no reaction.

These agglutination reactions with the Bulgar prisoners agreed with our findings obtained with the Serbian soldiers, and may serve as an explanation for the absence of a reaction in the latter, although we had believed them to be inoculated with Hirschfeld's mixed vaccine. It must be remembered, however, that it was possible to test the agglutination reactions among the Bulgars on one occasion only after the injection of the vaccine, as they were required for military purposes. Further, the highest agglutination reaction observed among the cases of para. C infection by us was $\frac{500}{5000}$.

Animal Inoculations.

A rabbit was inoculated subcutaneously with 50 million of each organism in a quadruple vaccine, nine days later with 100 million, and again eight days later the dose was repeated. The agglutinin response is tabulated in Table II.

TABLE II.—*Rabbit Inoculated Subcutaneously with T. A B C Vaccine.*

T.	A	B	C	
0	0	0	0	... Before inoculation.
50 Million T. A B C Subcutaneously.				
$\frac{100}{15000}$	$\frac{100}{10000}$	$\frac{50}{8000}$	$\frac{200}{5000}$	... 9 days after first inoculation.
100 Million T. A B C Subcutaneously.				
$\frac{800}{15000}$	$\frac{400}{10000}$	$\frac{400}{8000}$	$\frac{1200}{5000}$	... 8 days after second inoculation.
$\frac{800}{15000}$	$\frac{600}{10000}$	$\frac{600}{8000}$	$\frac{1500}{5000}$	... 9 days after third inoculation.

A second rabbit was inoculated subcutaneously with 10 million of each organism employed in the quadruple vaccine, and seven days later with 20 million, but a similar agglutination response was obtained as shown in Table II.

The two rabbit experiments just referred to show that these animals give a response to each member of the quadruple vaccine when the immunisation has been obtained with large or average doses.

TABLE III.—*To Show the Agglutinin Content of Immune Rabbit Sera Titrated with our Standard Antigens as Used in the Above Experiments.*

Serum.	Antigen.	Agglutination end-point.	Serum.	Antigen.	Agglutination end-point.
Para. C	Para. C	$\frac{5000}{5000}$	Para. A	Para. B	$\frac{100}{10000}$
Para. C	Para. B	$\frac{100}{5000}$	Para. A	Para. C	$\frac{0}{10000}$
Para. B	Para. B	$\frac{8000}{8000}$	Typhoid	Typhoid	$\frac{15000}{15000}$
Para. B	Para. C	$\frac{250}{8000}$	Typhoid	Para. C	$\frac{0}{15000}$
Para. A	Para. A	$\frac{10000}{10000}$	Typhoid	Para. B	$\frac{0}{15000}$

Cultural Tests.

Every strain of para. C tested by us has shown the same cultural reactions, and, further, these reactions have remained constant in stored laboratory cultures.

The organism is a motile Gram-negative bacillus. It ferments glucose, mannite, maltose, dulcitol, and sorbite with gas production, while cane sugar and lactose remain unchanged. Litmus milk is first acidified, the medium gradually returns to neutral point, and finally is rendered alkaline in three to four days. No strain which we have investigated has produced indol.

Since the above observations were made in Macedonia we have further investigated the serological reactions of the para. C bacillus and compared its antigenic properties with the other members of the enterica group of organisms. Rabbit antisera have been prepared and the reactions to the enterica group, including the para. C bacillus, have been studied. Three types of vaccines were employed: (1) heat-killed, (2) formol-killed, and (3) vaccines grown in 1 per cent. dextrose[10] and killed with formalin. Para. C. vaccines have also been employed for the inoculation of men who offered their services, and the antigenic properties were observed in these healthy individuals, many of whom were ex-soldiers and whose sera contained typhoid and paratyphoid (A and B) agglutinins.

Methods of Preparation of Vaccines.

The vaccines employed by us in these investigations were made as follows:—

1. *Heat-killed vaccines.*—A 24-hour agar culture of this organism was emulsified in normal saline, filtered through fine linen, and heated to 56° C. for one hour. The vaccine was then placed in the ice chest, and later tested for sterility. Suitable dilutions of the emulsion were made with saline containing 0·25 per cent. carbolic acid.

2. *Formalin-killed vaccines.*—A 24-hour agar culture was emulsified in normal saline and filtered as above. To the emulsion 0·1 to 0·14 per cent. of formalin was added and the emulsion placed in the ice safe till sterile. Suitable dilutions were made as above.

3. *Acid dextrose vaccines.*—Organisms were grown in 1 per cent. dextrose in peptone water and the tubes were incubated for 24 hours. The acidified medium was centrifugalised and the supernatant fluid discarded. The deposit of organisms was diluted with saline containing 0·1 to 0·14 per cent. of formalin and treated subsequently as in method 1.

Some of the volunteers received one type of vaccine only, and others one type followed by another. Rabbits were also inoculated with the vaccines and the agglutinin response tested.

The antigens used were made as follows:—

The organism was subcultured daily for 10 days to obtain an active growth. Agar flasks were inoculated with the tenth subculture, and the flasks were incubated for 24 hours. The growth was washed off with 0·1 to 0·14 per cent. formol saline. The emulsion was filtered and placed in the ice chest till sterile. The antigen was diluted to standard, i.e., 1000 million bacilli per c.cm., and 0·25 per cent. carbolic acid added. The end-point of agglutination is expressed as a fraction, the numerator denoting the highest dilution in which agglutination occurred, the denominator being the end-point of the antigen on its homologous antiserum. Our methods for the agglutination reactions were constant, and we followed in certain details the technique recommended by Dreyer. The tubes were incubated at 55° C. for two hours, and the readings taken after half an hour at room temperature.

The *absorption tests* were carried out as follows:—

To one volume of the serum diluted to 1 in 10 with normal saline a creamy, thick emulsion of the absorbing bacillus[11] was added in three doses, i.e., one half and two quarter

[10] This vaccine will be called subsequently in this paper the "acid dextrose vaccine."

[11] These emulsions were approximately of the same strength.

volumes, at intervals of three hours, and incubated at 55° C., unless otherwise stated. After nine hours the tubes were placed on the ice overnight. The treated emulsions were centrifugalised and the test performed on the supernatant clear fluid. A control saline and serum tube was heated together with the emulsions.

Agglutinin Response of Rabbits to Injections of the Para. C Bacillus.

A rabbit was inoculated intravenously with a formol agar vaccine of the para. C bacillus, and the response is recorded with the dosage in Table IV.

TABLE IV.—*Intravenous Inoculation of a Rabbit with Formol Agar Vaccine of the Para. C Bacillus.*

Date of inoculation.	Dose.	Date of testing serum.	End-point of agglutination.
20/10/19	100 million	24/10/19	$\frac{500}{20000}$
24/10/19	250 ,,	26/10/19	$\frac{10000}{20000}$
30/10/19	500 ,,	3/11/19	$\frac{20000}{20000}$

This rabbit gave a rapid serum response $\frac{20000}{20000}$, that is, to the end-point of the antigen.

This para. C antiserum was tested against the stock laboratory antigens, *B. typhosus* and *B. paratyphosus A, B,* and *C*, with the following results: A control tube containing normal human serum and the para. C antigen was also observed.

Typhoid antigen and para. C antiserum ...	$\frac{0}{20000}$
Para. A ,, ,, ,, ,, ...	$\frac{0}{20000}$
Para. B ,, ,, ,, ,, ...	$\frac{0}{20000}$
Para. C ,, ,, ,, ,, ...	$\frac{20000}{20000}$
Para. C ,, ,, ,, normal serum	$\frac{0}{20000}$

From these results it will be seen that the para. C agglutinin is specific, as no reaction occurred with the typhoid or paratyphoid (A or B) antigens.

TABLE V.—*Absorption Test. Para. C Antiserum* $\frac{20000}{20000}$, *Saturated with* B. typhosus *and Paratyphoid Bacilli A, B, and C.*

Antiserum.	Absorbing bacillus.	Titre after absorption.	Control saline serum.
Para. C.	*B. typhosus.*	$\frac{15000}{20000}$*	$\frac{20000}{20000}$
,,	*B. para. A.*	$\frac{15000}{20000}$*	$\frac{20000}{20000}$
,,	*B. para. B.*	$\frac{15000}{20000}$*	$\frac{20000}{20000}$
,,	*B. para. C.*	$\frac{0}{20000}$	$\frac{20000}{20000}$

* In all cases 1 in 15,000 dilution gave complete agglutination; the end-point was not obtained.

It will be seen from Table V. that no absorption of the "C" agglutinins followed the addition of the typhoid and the A and B bacillary emulsions. The effect of absorbing the stock para. B antiserum with emulsions of para. B and C showed that a B antiserum of $\frac{5000}{5000}$ titre was completely desaturated by a para. B bacillus, while the para. C emulsion removed none of the para. B agglutinins.

It will be seen from the above-mentioned experiments that the other members of the enterica group absorbed none of the agglutinins from a para. C antiserum of high titre, and that the para. C bacillus absorbed none of the agglutinins from this sample of para. B antiserum. It is necessary, however, to realise that some para. C antigens have a definite B fraction, while apparently a B fraction may develop in a C antigen which was pure when the organism was first isolated.

We conclude that the para. B and para. C bacilli, although identical in fermentation reactions, are distinct bacteria as judged by serological reactions, as Professor Hirschfeld originally stated.

The agglutinin reactions and absorption tests with a para. C antiserum were tested against two strains of Gaertner bacilli and Aertrycke bacilli kindly supplied to us by Colonel S. L. Cummins, A.M.S., with the results shown in Table VI. It will be seen from this table that the paratyphoid C strain has apparently no relationship with the Gaertner or Aertrycke group of bacteria, as in no case was any agglutination or absorption phenomenon observed.

Sir Frederick Andrewes, to whom we are greatly indebted for showing us the results of all his investigations, has found that typical strains of suipestifer and para. C are identical serologically. We have tested the *original strain* of para. C isolated by Hirschfeld in 1916 with a standard strain of suipestifer furnished by Andrewes. On serological evidence the two strains are identical. Cultural differences with xylose, arabinose, and dulcite may occur with some strains of suipestifer and para. C. The results obtained by him would appear to us to be of the utmost importance epidemiologically.

TABLE VI.—*Agglutinin and Absorption Reaction of Five Bacteria on Para. C Antiserum.*

—	Agglutinin reaction.	Absorption reaction.
Para. C antiserum on—		
Para. C bacillus	$\frac{20000}{20000}$	$\frac{250}{20000}$
Gaertner, Bainbridge	$\frac{0}{20000}$	$\frac{15000}{20000}$*
Gaertner	$\frac{0}{20000}$	$\frac{15000}{20000}$*
Aertrycke, Newport	$\frac{0}{20000}$	$\frac{15000}{20000}$*
Aertrycke, Mutton	$\frac{0}{20000}$	$\frac{15000}{20000}$*

* The end-point of the reaction was not determined.

The Effects of the Injection of Multiple Vaccines Containing B. typhosus *and* B. paratyphosus A, B, *and* C *into Rabbits.*

Rabbits were injected with the quadruple vaccine subcutaneously and intravenously, as noted below. Three types of vaccines were employed: (1) heat-killed, (2) formol-killed, and (3) acid dextrose.

TABLE VII.—*To Show Results of Injecting Subcutaneously equally graduated Doses of Heat-killed Vaccines of* B. typhosus *and* B. paratyphosus A, B, *and* C.

Date of immunisation.	Dose.	Date of testing serum.	End-point of agglutination to—			
			T.	A	B	C
5/1/20	100 million	5/1/20	$\frac{0}{8000}$	$\frac{0}{6000}$	$\frac{0}{5000}$	$\frac{0}{20000}$
		8/1/20	$\frac{0}{8000}$	$\frac{0}{6000}$	$\frac{0}{5000}$	$\frac{0}{20000}$
12/1/20	200 ,,	12/1/20	$\frac{50}{8000}$	$\frac{50}{6000}$	$\frac{50}{5000}$	$\frac{0}{20000}$
19/1/20	500 ,,	19/1/20	$\frac{200}{8000}$	$\frac{250}{6000}$	$\frac{400}{5000}$	$\frac{100}{20000}$
		26/1/20	$\frac{3000}{80000}$	$\frac{1000}{6000}$	$\frac{1500}{5000}$	$\frac{2000}{20000}$

From Table VII. it will be seen that the agglutinin response was present to each component of the quadruple vaccine when the heat-killed vaccine was employed.

A similar experiment was carried out with the formol-killed vaccine, and in this instance, as in the case with the heat-killed vaccine noted above, a similar rise of agglutinins was noted. The quadruple vaccine was given in doses of 100, 200, 400, and 500 million at six-day intervals, and the agglutinin titre of the serum rose from zero to $\frac{1000}{5000}$ with *B. typhosus*, $\frac{800}{6000}$ with para. A, $\frac{800}{5000}$ with para. B, and $\frac{800}{20000}$ with para. C antigens.

TABLE VIII.—*To Show the Results of the Subcutaneous Inoculation of Rabbits with the Quadruple Acid Dextrose Vaccine.*

Date of inoculation.	Dosage.	Date of testing serum.	End-point of agglutination to—			
			T.	A	B	C
19/1/20	100 million	19/1/20	$\frac{0}{8000}$	$\frac{0}{6000}$	$\frac{0}{5000}$	$\frac{0}{20000}$
		26/1/20	$\frac{0}{8000}$	$\frac{25}{6000}$	$\frac{0}{5000}$	$\frac{25}{20000}$
30/1/20	200 ,,	30/1/20	$\frac{25}{8000}$	$\frac{100}{6000}$	$\frac{25}{5000}$	$\frac{100}{20000}$
7/2/20	400 ,,	12/2/20	$\frac{100}{8000}$	$\frac{100}{6000}$	$\frac{100}{5000}$	$\frac{200}{20000}$

A second rabbit was inoculated in this case intravenously with the quadruple acid dextrose vaccine, and the agglutinin response is recorded in Table IX.

TABLE IX.—*To Show the Immediate and Active Response Obtained with Quadruple Acid Dextrose Vaccine when Injected Intravenously.*

Date of inoculation.	Dosage.	Date of testing serum.	End-point of agglutination to—			
			T.	A	B	C
30/1/20	100 million	30/1/20	$\frac{0}{8000}$	$\frac{0}{6000}$	$\frac{0}{5000}$	$\frac{0}{20000}$
7/2/20	200 ,,	4/2/20	$\frac{0}{8000}$	$\frac{100}{6000}$	$\frac{100}{5000}$	$\frac{200}{20000}$
		11/2/20	$\frac{100}{8000}$	$\frac{1000}{6000}$	$\frac{1500}{5000}$	$\frac{1000}{20000}$

The difference in response is very marked, as shown in these two tables. In 19 days the acid dextrose vaccine given subcutaneously excited but a feeble response to all four

antigens, whereas the same vaccine given intravenously excited in 11 days a marked reaction with the paratyphoid strains, but not with the typhoid.

It was thought that this feeble response to the acid dextrose vaccine employed subcutaneously might be due to the absence of reaction in the tissues at the site of inoculation. Two further rabbits were inoculated subcutaneously—(a) with acid dextrose vaccine only, while (b) received 0·5 c.cm. of ether at the site of inoculation to ensure a tissue response. In Rabbit (a) the agglutinin reactions were again feeble, similar to the previous experiment referred to in Table VIII., while in the case of Rabbit (b) no advantage was obtained by exciting a marked local reaction by means of ether. Rabbit (a) subsequently received two injections of the quadruple formol-killed vaccine subcutaneously and Rabbit (b) one injection of acid dextrose vaccine intravenously, and in both cases a marked reaction to all four antigens occurred.

From these experiments it may be concluded that as an antigen for the preparation of typhoid and paratyphoid (A, B, and C) agglutinating antisera the heat-killed and formol-killed vaccines are of greater utility than the acid dextrose if the subcutaneous method of inoculation is employed, but the acid dextrose vaccine gives an equally good result if paratyphoid vaccines are injected intravenously.[12]

The Result of the Subcutaneous Inoculation of Man with Paratyphoid C Vaccines.

Over 30 volunteers have been inoculated subcutaneously with paratyphoid C vaccines. The highest agglutinin responses were obtained with the formol-killed vaccines. The inoculation dosage varied in amount, and the resulting serum reactions appeared to have no relationship with the number of bacilli injected. Thus, after a single dose of 250 million of the formol-killed vaccine, a titre of $\frac{1500}{20000}$ was obtained; in another instance, although 11 inoculations were given over a period of four months, seven of which contained 1000 million bacilli, the para. C agglutinins never rose above $\frac{400}{20000}$, while in other cases no reaction occurred. Two healthy men received two injections each of 250 and 500 million of a para. C vaccine at an interval of eight days. In one instance the titre of the serum to para. C rose from 0 to 1500 in four weeks, while in the other instance no response was effected in the same period. It would appear, therefore, that the agglutinin response to paratyphosus C in any particular individual is uncertain and may be altogether absent. These findings agree with our observations made on the Serbian soldiers, and on the Bulgarian prisoners in Macedonia.

Agglutination Response to the Inoculation of Formol-killed Paratyphoid C Vaccines.

Twelve men were inoculated with the formol-killed vaccine, and in all but two, in whom no response was excited, a marked agglutination reaction occurred. Local reactions were noted in a few of these cases. Four cases received a single injection of para. C vaccine, and the titres of the sera between the fourteenth and the twenty-first day day were 1 in 500, 1 in 800, 1 in 1000, and 1 in 1500 respectively, with an antigen of 1 in 20,000 end-point. Three men received two doses of vaccine at intervals of six to eight days, and after 15 days the response to para. C was 1 in 200, 1 in 300, and 1 in 1500 respectively. Of the three remaining cases one received doses of 500 and 750 million, and two 500 and 1000 million, at an interval of seven days, and the titres of the sera for C agglutinins were 1 in 300, 1 in 100, and 1 in 1100 respectively.

From the above experiments, in which formol-killed paratyphoid C vaccines were used, a definite agglutinin response occurred, but the dosage of the vaccine did not correspond to the agglutinin reaction in any way, as one man after three doses failed to respond, while a second, who received a single inoculation of 250 million, gave a reaction of 1 in 1500.

The Inoculation of Men with the Acid Dextrose Vaccine.

The result of subcutaneous inoculation of the acid dextrose vaccine was observed in 11 cases. In no instance was any local reaction observed, and with one exception, in which a slight para. C reaction was obtained previous to inoculation, the responses excited were feeble. In the case referred to, doses of 250 and 500 million were given, and at the end of three weeks a reaction of 1 in 1500 was obtained. In two cases in which 250 and 500 million bacilli were injected with a 5-day interval, no agglutinin response was obtained, while in eight instances the men received two or more doses varying from 250 to 1000 million, but only a very feeble agglutination reaction occurred.

It would appear, therefore, that the acid dextrose vaccines, when given subcutaneously in man, fail to excite any marked agglutinin response, and these findings are similar to those made in rabbits when this form of vaccine was used subcutaneously.

The Action of Heat on Human and Rabbit Paratyphoid C Agglutinins.

Seven human para. C antisera were obtained by the subcutaneous injection of paratyphoid C vaccine. Four of these antisera diluted to 1 in 10 with normal saline gave titres of 1 in 800, 1 in 1000, 1 in 1100, and 1 in 1500 respectively. These sera were heated for nine hours at 55° C., and when re-tested it was found that the end-points had fallen to 1 in 200, 1 in 200, 1 in 25, and 1 in 400 respectively. The three remaining para. C antisera, when diluted, were heated at 55° C. for six hours. The end-points of agglutination before heating were 1 in 150, 1 in 300, and 1 in 2000; after heating the end-points had fallen to 1 in 50, 1 in 200, and 1 in 800 respectively. It will be observed that in all cases the paratyphoid C agglutinins were reduced by heat at 55° C. In one experiment in which a sample of human antiserum was heated at 37° C. for nine hours a considerable loss of agglutinin content occurred. Two rabbit antisera were heated along with the human antisera at 55° C. for nine hours, but in one case a slight fall from 1 in 25,000 to 1 in 20,000 occurred, while in the other a fall from 1 in 1500 to 1 in 1250 resulted.

Thus the human paratyphoid C agglutinins appear to be partly thermolabile, while the rabbit para. C agglutinin is but slightly affected by heat.

Absorption of Paratyphosus C Agglutinins from Human Sera: Zonular Agglutination.

The sera of four men who had been inoculated subcutaneously with paratyphosus C vaccine, and in whom a good response was excited, were absorbed with emulsion of *B. paratyphosus C.* Before the absorption test was carried out, the titres of the sera were 1 in 800, 1 in 1000, 1 in 1100, and 1 in 1500 respectively. In all four cases complete removal of the paratyphoid C agglutinins resulted, but, as already stated, the thermolability of the para. C agglutinins in man must be fully allowed for, as we found that in the serum saline control tubes the titres of the sera had fallen very considerably.

The absorption tests were carried out with two of these antisera at 37° C., instead of 55° C., but it was found that the agglutinins were completely removed, as occurred at the higher temperature.

Zonular agglutination was noted in 3 of the 35 men inoculated with the para. C vaccines in London, but was not observed in any of our rabbit antisera. The three human sera above referred to gave agglutination readings as follows:—

(1) 1/25 = 0, 1/50 incomplete, 1/100 to 1/1000 complete, 1/2000 end-point of agglutination.

(2) 1/25 a trace, 1/50 to 1/100 complete, and 1/1000 end-point of agglutination.

(3) 1/10 = 0, 1/25 a trace, 1/50 and 1/100 complete, 1/1000 end-point of agglutination.

This phenomenon, which may give rise to fallacies when human antisera are under investigation, has also been referred to by Macadam[5] while working in Mesopotamia.

The Formation of Paratyphoid B Coagglutinins in the Sera of Persons Inoculated with B. paratyphosus C.

Many of the men who acted as volunteers for these investigations had served in the army and had been inoculated with the triple enterica vaccine. The sera of these men were tested for the presence of typhoid and paratyphoid agglutinins. As a result of these observations the men were divided into two groups: (1) those who gave no reaction, and (2) those in whom a para. B response was present with a para. B antigen of 1–5000 end-point.

Each group was inoculated with a formol-killed paratyphoid C vaccine with doses varying from 250 to 1000 million, and as a result it was found that some men of both groups showed a definite rise in the titre of the para. B agglutinins, while others failed to respond. This para. B agglutinin response was not dependent upon the amount of paratyphoid C vaccine injected.

Para. C Infection in London.

In March, 1920, the *B. paratyphosus C* was grown in blood culture from a case of enterica admitted to St. Thomas's Hospital. On March 18th a girl (M. N.), aged 12 years, was admitted under the care of Dr. C. R. Box, who has kindly permitted us to publish the following notes.

The patient had been ill for two days, suffering from headache, vomiting, and general malaise. She had a rigor immediately preceding admission. On admission the temperature was 102° F. and the pulse 112. No spots were seen. The spleen was enlarged and palpable. On March 21st the temperature reached 104°, and the patient was delirious. Pulse 132. Epistaxis occurred. The temperature lasted for six days after admission, and then fell to subnormal

[12] It must be noted that the para. C antigens prepared by us in London were considerably more sensitive than the typhoid and paratyphoid A and B, and that the results of the C agglutinin response must be considered with due regard to this factor.

and remained so throughout convalescence. Bowels were constipated throughout. A blood culture was made on March 22nd, and the serum was also collected. The blood culture in distilled water grew a Gram-negative motile bacillus, which gave the cultural reactions after seven days' incubation of the B and C bacillus.

The serum was tested on March 22nd and 29th and April 9th. On the first occasion against *B. typhosus* and *B. paratyphosus A* and *B* no agglutination occurred. The para. C reaction was also tested on the second and third occasions, but no reaction was obtained. This bacillus was not agglutinated by the patient's serum, and when tested with the stock typhoid and paratyphoid A, B, and C antisera gave the following results: T = O, A = O, B = $\frac{400}{5000}$, and C = $\frac{20000}{20000}$. The fæces were examined on four occasions, but the para. C bacillus was not recovered. No history was obtained of any relative having been in the East. The father, a soldier, had been in France, but had never suffered from any enterica-like infection.

Sir Frederick Andrewes has very kindly informed us of a case of para. C infection which occurred at St. Bartholomew's Hospital in 1919, in a man who had been in Mesopotamia. The organism was obtained by blood culture and from the urine. The case, however, was *not* enterica on clinical evidence.

In conclusion, we offer our thanks to Professor Hirschfeld, who supplied us with the original strain of the *B. paratyphosus C* in 1916, and to our various colleagues in the Balkans who assisted us with our observations, more especially to Captains W. J. Deadman and J. Anderson, R.A.M.C.

SYPHILITIC AORTITIS.

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WHILE working at the Ulster Volunteer Force Hospital with Dr. J. E. MacIlwaine I was greatly struck by the fact that the Wassermann reaction had been positive in all the cases which showed evidence of an aortic lesion, and I therefore have sent every aortic case met with at pensions boards to have a Wassermann test done. The result showed how important it is to have the blood examined in these cases. Of 25 cases met with in the hospital and at the boards only one gave a negative Wassermann. In this case there was a definite history of rheumatism in a young man and the aortic lesion was a stenosis, thus differing from the syphilitic type, which is never a true stenosis.

The Ætiology of Aortitis.

Any infection may cause aortitis, but the two most common are rheumatic fever and syphilis.

The relative age-incidence in these two diseases is important. In patients below 40 a fair proportion give a history of acute rheumatism. The recruiting for the war showed that a considerable number of aortic lesions had a rheumatic history, while in recent pensions work the great majority of cases point to a specific infection. There is often great difficulty in making a definite diagnosis as to cause, especially where syphilis is denied and a Wassermann test is negative. The post-mortem room is a great teacher, and often upsets a clinical diagnosis, as recent work by Warthin[1] has proved. He has shown that spirochætes are present in the aorta, aortic valves, and even in the myocardium in a great many cases in which a clinical diagnosis of syphilis had not been made.

The history of rheumatic fever does not exclude the possibility of a coexisting syphilitic lesion. For instance, one of Dr. MacIlwaine's cases in the U.V.F. Hospital gives a history as follows:—

Pensioner, age 33. Rheumatic fever in January, 1916. Discharged from the army in June, 1916, with V.D.H. In June, 1917, he contracted syphilis, and received very inadequate treatment. He was admitted to hospital on Jan. 1st, 1920, with a history of dyspnœa and attacks of sudden, sharp, stabbing pain across the upper part of left chest at intervals varying from two weeks to two months; occasional fainting turns; great feeling of alarm and dread. On examination the heart was found slightly dilated. No increase in cardiac dullness in aortic area. A rough presystolic with accentuated first sound in mitral area. B.P. 130 —diastolic 96. X ray showed a normal aorta and the "pear-shaped" type of heart. Wassermann was ++ with both Harrison's and Fleming's technique, which positive result, accompanied by pain, dyspnœa, and great depression, led one to suspect an early aortitis in addition to a rheumatic mitral lesion.

Syphilitic Aortitis.

This may be acute or chronic. Cases have been published where well-marked symptoms and signs have been present within two years of the primary lesion, and one case is on record where the aorta ruptured three months after the primary sore appeared.

In the majority of the cases the aortitis is of a much more chronic nature, and has been latent for a number of years, a sudden exacerbation of the lesion drawing attention to its nature. The majority of cases in the U.V.F. Hospital come into this chronic type. Syphilis has almost always been denied at first, probably due to the fear of loss of pension, and partly to the fact that the men thought they were completely cured because no signs have been seen for many years.

McCrae and Adami[2] divide arteries into two types—the elastic and the muscular. The aorta and its main branches are of the former type, and this elasticity is of the greatest importance. The aorta receives the first impulse of the blood wave, and is subject to sudden expansion. The elastic fibres, alternating in the media with the muscle fibres, are needed both to prevent undue distension and to bring the vessel back to normal. The change in this middle coat is the important one in syphilis, as it interferes with the contractile and expansile power of the aorta.

The ascending and transverse portion of the aorta are specially susceptible. Some attribute this to the infection being carried by the vasa-vasorum, a theory which also accounts for the frequent involvement of the cerebral arteries. Another theory is that the spread is a lymphatic one, and the first part of the aorta, containing a large number of lymphatics, is most frequently affected. These lymphatics follow the vasa-vasorum, and account for the perivascular infiltration. The change is principally in the media, and is of a chronic inflammatory nature. The tunica adventitia is also involved, producing a connective tissue overgrowth. Intimal changes are secondary and also show a connective tissue hyperplasia. If the weakening of the media is slow, the secondary thickening of the intima counteracts the strain, and the dilatation, if present, is slight; if change in the media is rapid the wall may give way, with formation of an aneurysm. Dilatation may be either local or generalised, and depends partly on the strength of the aortic wall and partly on the internal pressure.

Non-syphilitic arterio-sclerosis differs from the syphilitic type both in distribution and in the coat affected. In the former the patches are usually seen at the orifices of the aortic branches, especially the intercostals, and the change is primarily an intimal one, often with calcareous deposits. In the latter the patches are usually transverse, bear no relationship to emergent vessels, have a puckered appearance, and are usually secondary to a mesaortitis.

The aortitis arising from acute rheumatism, streptococcal infections, and so forth, tends to subside as the primary lesion improves. In syphilis the lesion is progressive unless vigorous antisyphilitic treatment is carried out, and even then it is very refractory to treatment. The aorta is one of the most frequent sites of latent syphilis; Warthin demonstrated active lesions of the aorta in every case of latent syphilis examined.

The lesion usually leads to a dilatation of the aorta, either general or localised. The aortic insufficiency is often attributed to a relative incompetence following the aortic dilatation, but the finding, by the Levaditi method, of spirochætes in the aortic tissues shows that the insufficiency is an organic one, and, as is usual in syphilis, the change is one of dilatation due to sclerosis of the valves. According to Mix[3] syphilis never causes an aortic stenosis.

The specific change may involve the heart muscle, leading to all the symptoms of a myocarditis. Two of the cases that died in the U.V.F. Hospital showed well-marked signs and symptoms of myocarditis. There was a post mortem on one case, and the heart showed myocarditis. Spirochætes were not looked for, so the specific origin was not proved.

Symptoms.

Early diagnosis of these cases is important. Advanced cases of aortitis, with definite, well-formed aneurysms, show usually the signs and symptoms of the latter. The symptoms and signs of syphilitic aortitis are numerous. They are divided into those due to the actual lesion and those due to pressure, which latter are a late manifestation. Of the early symptoms, pain and dyspnœa are the most important, with, in addition, a peculiar, septic, sallow look, sometimes accompanied by fever.

The patients usually have a feeling of lassitude, depression, and dread. Pain in aortitis is referred to the upper end of the sternum, or beneath it, and is often anginal in character, radiating to the shoulder and arms, and either constant or intermittent. When referred to the apex it is generally due to an accompanying myocarditis. A characteristic feature of the pain is its occurrence during the night. Often there is merely a feeling of oppression about the heart or at the upper end of the sternum (one of the patients who died complained of a sudden "catch" at the root of his neck), and this

is usually accompanied by a feeling of alarm and dread. In certain cases the pain is referred to the epigastrium, and may lead to errors in diagnosis. Pain is a more prominent symptom in some patients than in others, and does not seem to depend entirely on the extent of the aortitis or on the amount of dilatation. The cause of the pain is, according to Sir Clifford Allbutt,[4] due to an involvement of the aorta, especially just above the sigmoid valves; the undue tension of the fibrous outer coat being the immediate cause.

The dyspnœa usually has a sudden onset without any exciting cause, or occurs after slight exertion or excitement. The chief difficulty is an expiratory one, and, like the pain, it is usually much more marked at night. A sudden onset of dyspnœa in a man above 40, without any definite exciting cause, should always make one suspicious of an aortitis. The peculiar, sallow, septic appearance is striking, and in pensions work I always send such a case to have a Wassermann done, the result in the majority of cases being positive.

Vertigo has not in my experience been a very troublesome symptom. It is attributed by some to a cerebral endarteritis and cerebral ischæmia, by others to perverted impulses from an abnormal aorta being conducted through vagus to the brain.

Physical Signs.

The physical signs are variable; in an early case there may be little or no evidence of an organic lesion of the aorta or heart.

Often the first sign is an accentuation of the second aortic with a diastolic shock on palpation. The second aortic may have a peculiar ringing, musical character, and which extends to the bruit if present. A systolic murmur is often present, and points, not to a stenosis, but to a dilatation of the first part of the aorta. Other physical signs are fullness of the veins of the arms, neck, and shoulders, pointing to some obstruction to venous return; marked visible arterial pulsation in neck; suprasternal pulsation, or pulsation in second right or left interspaces; tracheal tug. Percussion sometimes reveals an increased dullness in aortic areas, but this is often difficult to estimate correctly. The two most important diagnostic tests, however, are the Wasserman test and an X ray of the aorta.

The X ray shows either an increase in density of the shadow or a change in the contour. At least four different types have been described: (1) Elimination of the aortic knob. As the aorta turns to the left and downwards there is a small localised bulging called the "aortic knob." In a dilatation this becomes obliterated and the shadow is continuous. (2) Increase in aortic shadow to right, especially if the heart is not enlarged. (3) Uniform dilatation of the shadow. (4) Definite aneurysms.

In early cases the pathological process is usually limited to the first portion of the aorta, near the aortic valves, and at this stage the vessel is but slightly thickened, giving in an X ray merely a doubtful dilatation of the vessel in this region. As the aortitis develops we get secondary changes such as dilatation and hypertrophy of the heart.

Prognosis and Treatment.

The prognosis is bad, especially if there is any evidence of myocardial involvement; œdema is a very bad sign. The prognosis is often worse with a small than with a large aneurysm. Treatment is mainly antisyphilitic, though any cardiac symptoms have to be dealt with also. Pot. iodide up to ʒss. doses three times a day, with mercurial inunctions daily, have been used. Novarsenobillon in small doses, 3 gr. every ten days, has also been tried. Most of the cases showed some improvement, but, unfortunately, they are nearly all cases in which syphilis has been present for a number of years, and in consequence are very refractory to treatment.

Conclusions.

1. A Wassermann test should be done in every case of aortic disease.
2. Anginal pain is very frequently associated with an aortitis. The aorta, therefore, in every such case should be thoroughly investigated.
3. Cases of syphilis which are refractory to treatment are often found to have a specific lesion of the aorta.
4. Sudden fatal cases are often found, on post-mortem examination, to have died from a syphilitic aortitis.

I am greatly indebted to Dr. MacIlwaine for his kindness in allowing me to have access to the cases in his wards.

References.—1. Warthin, A. S.: American Jour. Med. Sci., 1916, clii. 2. McCrae and Adami: Text-book of Pathology. 3. Mix: Medical Clinics of North America, vol. i., No. 5. 4. Allbutt, T. C.: Diseases of the Arteries.

Reviews and Notices of Books.

THE DIAGNOSIS OF NERVOUS DISEASES.

Fifth edition, revised and enlarged. By Sir JAMES PURVES STEWART, K.C.M.G., C.B., M.D., F.R.C.P., Senior Physician to the Westminster Hospital, &c. London: Edward Arnold. 1920. Pp. 584. 30*s*.

IT is some three years or more since we last reviewed Sir James Purves Stewart's text-book of "Diagnosis of Nervous Diseases," which appears now in a fifth edition. Some 10 or 15 new illustrations have been added, and the whole book revised and in part rewritten. It takes its place as an eminently practical compendium of neurological doctrine on both organic and functional sides, characterised by wealth of clinical observation and succinct embodiment of information gleaned from a minute knowledge of neurological literature. It is nothing if not up to date. Limited though its scope may appear, it furnishes the physician and student with a thoroughly sound and extremely readable presentation of neurological knowledge, and its popularity is abundant evidence of its usefulness.

THE NEW PSYCHOLOGY AND ITS RELATION TO LIFE.

By A. G. TANSLEY. London: Allen and Unwin, Ltd. 1920. Pp. 284. 10*s*. 6*d*.

SINCE the appearance, now many years ago, of McDougall's "Introduction to Social Psychology" no psychological work more fascinating or more important to the general public has appeared than this. Mr. Tansley endeavours to describe the development and advances of psychology within recent years and its application to the problems of life. The book is based mainly on the writings of Freud, Hart, Jung, and Trotter, but its author has the courage of his convictions and does not hesitate to differ from these authorities where he thinks fit to do so. The result is an exceedingly temperate and thoroughly trustworthy account of present-day psychology, for which a wide circle of readers can be confidently guaranteed. Few psychologists will agree entirely with the writer's views, but none will be found to deny their reasonableness and their sanity. A detailed or technical criticism of them would be out of place here. It will suffice to recommend the book wholeheartedly to the cultured reader who desires a fair presentation of the general position of modern psychology and of its bearing on human life.

NERVOUS AND MENTAL DISEASES.

Ninth edition, thoroughly revised. By ARCHIBALD CHURCH, M.D., Professor of Nervous and Mental Diseases in the Northwestern University Medical School, Chicago, &c.; and FREDERICK PETERSON, M.D., formerly Professor of Psychiatry, Columbia University, &c. London and Philadelphia: W. B. Saunders Company. 1920. With 350 illustrations. Pp. 949. 30*s*.

WE reviewed the last edition of this well-known American text-book in 1914, commenting favourably on its presentment of the subjects with which it deals, and on its excellent illustrations and format generally. The present edition contains many additional paragraphs derived from war experiences in neurology. We feel, on looking through the volume, that the chapters devoted to hysteria and the neuroses and psychoneuroses generally rather stand in need of modernising, and it appears unnecessary to give the morphology of the hysterical fit in such detail when comparatively little space is allotted to a discussion of the pathogenesis of hysterical symptoms. A section given to hypnotism is included under "Disorders of Sleep." Some of the rarer nervous diseases, such as torsion spasm, tuberose sclerosis, Alzheimer's disease, encephalitis periaxialis diffusa, do not appear to be mentioned. The volume, nevertheless, will continue, we think, to meet with that favourable reception which it has so long earned.

A MANUAL OF NEURASTHENIA (NERVOUS EXHAUSTION). By IVO GEIKIE COBB, M.D., M.R.C.S., Neurologist, Ministry of Pensions; formerly Neurologist, Brinnington Section, Second Western General Hospital. London: Baillière, Tindall, and Cox. 1920. Pp. 366. 12*s*. 6*d*.

NOTWITHSTANDING the whittling down of the conception of neurasthenia by the disciples of the psychoanalytic school to the results of auto-eroticism in young people, nervous exhaustion exists to a somewhat larger extent than a perusal of their treatises might lead the student to suppose, and will continue to exist when teachers, if ever, have all become psychoanalysts and psychoanalysis is a part of the educational curriculum. If neurasthenia was rife enough in the nineteenth century to be called "American nervousness" or the "English malady" in the eighteenth, it is scarcely likely to have all but vanished in the twentieth. According to Dr. Cobb, it is on the increase. Our terminology or our nosological limit matters little, in fact, so long as we agree that neurasthenia is a syndrome or symptom-complex and not a disease per se. Neurasthenic symptoms of fatigue, mental and physical, with accompanying headache, insomnia, and subjective sensations of all sorts, with or without more obvious gastro-intestinal symptoms, are well known to every practitioner of medicine, who would fain find a panacea therefor if only to be himself saved from the neurosis. No amount of terminological juggling avails to preserve him from daily contact with neurasthenic reality. To all such we recommend Dr. Cobb's volume. With sound judgment he avoids extremes of ætiological opinion at the same time as he accepts symptomatological facts. And he will be blessed by the worried physician for having devoted almost one-half of his book to treatment.

FUNCTIONAL NERVE DISEASE. An Epitome of War Experience for the Practitioner. Edited by H. CRICHTON MILLER, M.A., M.D., late Consulting Neurologist, 4th London General Hospital. London: Henry Frowde and Hodder and Stoughton. 1920. Pp. 208. 8*s*. 6*d*.

THE appearance of a symposium on "Functional Nerve Disease," contributed mainly by psychologists and psychotherapists, and edited by a psychotherapist, is doubtless a sign of the times. There are many "functional nerve diseases" not so much as mentioned in the volume, which deals almost entirely, one gathers, with hysteria. Though a section is entitled "The Anxiety Factor," Dr. Prideaux, in his contribution, restricts "anxiety neurosis," as opposed to "anxiety hysteria," to cases of physical origin, secondary to organic conditions of the viscera and endocrine glands, and declares they are not amenable to psychotherapy. Other psychopathologists, of course, disdain a somatic origin for any "anxiety" state whatever. "Neurasthenia" and "psychasthenia" do not find much favour with the contributors, but we learn a great deal about "conflict" and "adjustment," about "repression" and "regression." Dr. Crichton Miller, in his introduction, adopts the wholly commendable attitude that the psychical and the physical interact, and that to ignore either at the expense of the other is fatally obscurantist; despite which the work, as a whole, tends to ignore physical ætiology and physical symptomatology. We are not surprised, therefore, to find one contributor stating that "drugs should have no part in psychotherapeutics; tonics are unnecessary, the virtue of valerian is a superstition, a placebo is anathema, and the use of bromides not only rests upon heresy, but is physically and mentally harmful." From such iconoclastic comment let the practitioner turn back to another page, where he will find that "drugs are often of undoubted value; the bromides are used for their sedative effect in conditions of restlessness and general nervous irritability; strychnine and nox vomica are of value when exhaustion and fatigue are prominent symptoms," &c. It is but right to state, however, that the editor has been so well aware of the "conflict" among the psychotherapists themselves that he has asked Dr. William McDougall to make a critical summary in a final chapter, and this has been done with conspicuous fairness. In fact, without this last contribution the practitioner would be in a poor way towards understanding better what the war has really taught the psychologist. Considered individually, the contributions will be scanned with interest by the neurologist, who nevertheless may raise a mild complaint that the title of the book does not give an adequate clue to its contents.

PSYCHO-ANALYSIS. A Brief Account of the Freudian Theory. By BARBARA LOW, B.A. Introduction by ERNEST JONES, M.D., M.R.C.P. London: George Allen and Unwin, Ltd. 1920. Pp. 187. 5*s*.

Miss Low's précis of Freudian lore is intended for those who have not time to study original authorities, and it embodies a useful presentment of the subject strictly from the viewpoint of the founder of the theory. The exposition follows lines with which the student of Freudian doctrine is, of course, familiar, and is given in simple language with useful illustrative instances. Miss Low, who is not, apparently, a member of the medical profession, speaks on various pages of "patients treated by myself," and thus the important point is incidentally raised to what extent ignorance of or indifference to psychotherapy on the part of the profession results in patients going to the unqualified for what they want. She repeats the stock tenet of the Freudian that the physician—Miss Low rather avoids the word and speaks almost invariably of the Analyst (with a capital)—must not be teacher, suggestionist, ethical adviser, and so forth, but simply a seeker after the patient's own discovery of himself; yet almost on the same page she talks of the analyst using the influence which he obtains over the patient, of his leading the patient to weave the disentangled threads into a new whole, and so on. The book concludes with a sanguine forecast of the probable social and educational results of psychoanalysis, among which, it seems, are to be numbered the transference of buildings once occupied as prisons into educational institutions, and the removal of repressive law and custom from their action in imposing penalties on impulse-freedom. Children, it appears, even infants, if of opposite sexes, will not share beds with each other, or bathe together, or be dressed or undressed in each other's presence, or, worst of all, sleep with their parents; yet, oddly enough, these will not be so apt to be "over-clean, over-nice, over-proper" in regard to the behaviour of the very young, but will allow them to "play freely with actual dirt of any kind they spontaneously find, and fully express their interest in their own bodily functions."

TREATMENT OF THE NEUROSES. By ERNEST JONES, M.D., M.R.C.P., President of the British Psycho-analytical Society. London: Baillière, Tindall, and Cox. 1920. Pp. 233. 10*s*. 6*d*.

THE greater part of Dr. Ernest Jones's readable volume on the treatment of the neuroses is concerned with hysteria and its handling by the various psychotherapeutic methods at present in vogue—viz., suggestion, including hypnotism, re-education, and psycho-analysis, though physiological measures and the general management of hysterical cases are not ignored. He writes fairly and judicially of all methods, pointing out their advantages and disadvantages, but deals with psycho-analysis at greater length and with greater persuasiveness than in the case of any of the others. He has rather reversed the position formerly taken up by himself in regard to the treatment of mild cases of psycho-neurosis, apparently holding that they should have the most radical treatment of all—i.e., the psycho-analytic treatment—in order to avoid subsequent relapses and increasing psychotherapeutic difficulty. He has only heard of one case in which another method, the hypnotic, succeeded better than the psycho-analytic. It can thus be maintained that failures in psycho-analytic treatment are the result of insufficient psycho-analysis. Notwithstanding Dr. Jones's able advocacy of the surpassing

advantages of psycho-analytic measures, his argument is unconvincing that as he himself has had experience of the methods and obtained the best results with psycho-analysis it is most to be commended for general use. The physician equally with the psychotherapist must judge for himself which method to pursue, and whether any method can be pursued solely and strictly by itself.

THE NEW PHYSIOLOGY IN SURGICAL AND GENERAL PRACTICE.

Fourth edition, revised and enlarged. By A. RENDLE SHORT, M.D., F.R.C.S., Senior Assistant Surgeon, Bristol Royal Infirmary; Lecturer on Physiology, University of Bristol. Bristol: John Wright and Sons, Ltd. 1920. Pp. 291. 9*s*. 6*d*.; paper covers, 7*s*. 6*d*.

THE last edition was published just before the war and bore a slightly different title. This edition has undergone considerable transformation, and much of it is new. Into the chapter on "Food Deficiency Diseases" have been incorporated most of the newer observations on the growth factors and on neuritis, scurvy, and rickets. The section on "Researches on Blood" deals in detail with blood transfusion after severe hæmorrhage, with coagulation of the blood as the basis of an exact pathology of hæmophilia, purpura, and hæmorrhagic jaundice, with anaphylaxis, and with the therapeutics of calcium salts. An entirely new chapter on the heart, by Dr. Carey Coombs and Dr. Herapath, is devoted to the polygraph and electro-cardiograph and an analysis of the results obtained therefrom. The chapter on "Surgical Shock" has been entirely rewritten in the light of war experience. Before diagnosing shock, it is considered necessary to exclude or allow for considerable loss of blood, concussion of the central nervous system or thorax, and various forms of toxæmia. In shock the heart is not primarily at fault, the arteries and superficial veins are contracted, and if the blood volume is between 65–70 per cent. of normal, and the blood pressure below 90, the condition is grave. The experimental means of inducing shock-like conditions in animals are described, and useful practical information is given as to the best means for its prevention and treatment. Adrenalin is accounted dangerous; transfusion of saline solution or gum-saline is inferior, both theoretically and in practice, to blood transfusion, which is the best remedial measure in our armamentarium. The recent work on the functions of the stomach and intestines is dwelt upon in connexion with injuries, diseases, and operations on these organs. It would seem "that the colon is not a necessary organ." The remarks on the colon as an organ of absorption raise the whole question of feeding by nutrient enemata. "Feeding with nutrients composed of peptonised milk is sheer starvation, but better results may be obtained with enemata composed of dextrose and long-pancreatised milk."

War surgery and bone-grafting have revived the question of the growth of bone, and the observations of Sir William Macewen as to the regeneration of bone are given some prominence. Whatever view is accepted, the practical point is that, even if bone deprived of periosteum can survive and form a useful graft, the periosteum should always be preserved if possible. The obscure relation between growth of bone, the healing of ununited fractures, and certain endocrine glands is indicated. The necessity of a more extended study of the genital glands and of the endocrines is emphasised. To the surgeon the chapter on the immediate and remote poisoning by chloroform is suggestive and explanatory. The functions of the spinal cord and peripheral nerves are next considered and the diagnosis of lesions discussed. The chapter on localisation of function in the brain has been brought up to date. Both these chapters will prove useful to surgeon and physician alike.

We cordially commend a careful study of this volume to all who wish to keep pace with the modern advances in diagnosis and treatment, as illuminated by the "new physiology," and set forth by one of its most accomplished and earnest students.

SURGICAL TREATMENT.

By J. P. WARBASSE, M.D., F.A.C.S. London and Philadelphia: W. B. Saunders Company. 1920. In three volumes. With 2400 illustrations. Vol. II., pp. 829; Vol. III., pp. 861.

A REVIEW of the first volume, which deals with the principles of treatment, operations, infective surgical diseases, and the surgery of bones and joints, was published in THE LANCET of Feb. 1st, 1919. The part at present under review consists of Volume II., which is concerned with regional surgical treatment, and Volume III., covering the special treatment of the intestines, genito-urinary organs, and so forth; a small separate volume contains a combined index to the whole publication, additional to the index provided with each part. The work represents an endeavour to provide the surgeon with an account of all varieties of treatment that apply to all surgical diseases, clearly a very difficult undertaking; yet despite the difficulty of the task the result is on the whole satisfactory.

It is unlikely that any really complete work on such a large subject could be produced, even in three volumes of this size. There are necessarily omissions. For instance, in the chapter dealing with the surgical treatment of hernia, no account is given of the use of the filigree in the repair of specially weakened abdominal walls. Possibly the author regards this as an obsolete operative measure, though he makes several mentions of the use of silver wire as a suture in hernia cases. He considers that it should be replaced by the employment of fascial or other grafts, methods of which he gives only the briefest accounts. But the test of the worth of such a work is whether or no it is of practical use. Will the surgeon engaged in the treatment of any particular case refer to it with confidence? It must be admitted that some sections are inferior to others, and even the best are not entirely complete. On the whole, however, the book has a genuine value, and will be of special use to the surgeon of limited experience, who will find in it helpful descriptions of surgical procedures with which he may not be familiar. If he refer to it for advice concerning matters of which he has a wide practical knowledge he may be disappointed.

There are abundant illustrations, mostly good, much new work is described, and the text is well arranged for easy reference.

AIDS TO ELECTRO-THERAPEUTICS.

By J. MAGNUS REDDING, F.R.C.S. London: Baillière, Tindall, and Cox. 1920. Pp. viii. + 196. 5*s*. net.

ABOUT one half of this book is devoted to electro-therapeutics. Of the remainder, 47 pages deal with X ray therapeutics, and then follow short chapters on radium, photo-therapy, and electro-diagnosis. The book concludes with an index of treatment. A considerable amount of information is thus conveyed in this small volume. Common forms of apparatus and the methods of using them are described in some detail, while the theory discussed is confined to that necessary to explain the mode of action of X rays and electric currents in the treatment of disease. The chapter on electro-diagnosis deals almost entirely with paralysis due to nerve *injury*, and much more of it is devoted to the clinical than to the electrical side of the subject. The electrical examination of paralysis due to inflammatory lesions, one of the most important parts of medical electricity, is not considered. The diagram shown in Fig. 2 does not represent the alternating current on the main, and the account in Chapter VIII. conveys the idea that the sinusoidal currents used in medicine differ from those taken from the A.C. main. However, the descriptions are for the most part clear and easy to understand. The book will be of use to those who are reading for the higher examinations in medicine and surgery, and its contents will form a useful résumé of some of the subjects required for the recently established Diploma in Medical Radiology and Electrology.

ADVICE TO CONSUMPTIVES.

Second edition. By NOEL DEAN BARDSWELL, M.V.O., M.D., F.R.C.P., Principal Assistant Medical Officer, Public Health Department, London County Council, and Medical Adviser to the Insurance Committee for the County of London; late Medical Superintendent, King Edward VII. Sanatorium. London: A. and C. Black, Ltd. 1920. Pp. 153. 3*s*. 6*d*.

THIS book is prefaced by a short note by the late Dr. C. Theodore Williams. It consists for the most part of a series of lectures given by the author to patients at Midhurst. A methodical turn of mind has induced Dr. Bardswell to keep a note of every question about consumption asked him by his patients, and the work is a classified collection of his answers, written with the authority given by experience, and it contains information of value to that section of the lay public which can afford to follow the advice.

With regard to rest and exercise the author seems, on the whole, to belong to the "active" rather than to the "passive" school, and he believes golf to be the best game that the consumptive can take up when he is completely convalescent. He also considers bathing, especially sea-bathing, as beneficial to most patients. Cycling, too, he regards as permissible for the majority of patients, provided it is made a means to an end, not an end in itself. But cricket, tennis, ski-ing, and toboganing are tabooed. Breathing exercises are also recommended, and smokers will be pleased to read that three pipes a day of good mild tobacco may be indulged in, provided there is no weakness of the throat. The managers of sanatoriums, catering rather for the amusement than for the health of their patients, might well study the author's remark that: "To go to a health resort and sit all day in a smoking room, playing cards, is not a good programme for the consumptive in search of health." A specially valuable section of this book is that which deals with emigration; the most important colonies and other places abroad are discussed from the point of view of the prospective consumptive emigrant.

The author's views as to risk of infection show much common sense, and the following lines are typical of his own attitude towards this problem. "For some years I shared a sleeping chalet with a friend who was suffering from somewhat advanced consumption. The chalet, open on three sides, was placed in the garden; our beds were about a yard apart. My day was spent for the most part in the open air, and my life generally was a healthy one. I never felt the least fear of becoming infected under these conditions of close contact. At the same time I should have absolutely declined to work day by day at the same desk with this patient in a stuffy city office."

EARLY ENGLISH MAGIC AND MEDICINE.

A Paper read before the British Academy, Jan. 28th, 1920. By Dr. CHARLES SINGER. London: Humphrey Milford. 1920. Pp. 34. 4*s*.

ALL researches into early medicine are interesting as showing the foundations of our present knowledge, and the medicine of our British and Anglo-Saxon forefathers should be of especial interest to us. Dr. Singer has collected a wonderful amount of information upon the subject, although, as it happens, a good deal of the ground had already been covered by Dr. J. F. Payne in his first series of FitzPatrick lectures. Dr. Singer distinguishes eight elements which go to make up the medicine of our early forefathers—namely, Greek medicine filtered through Latin; ecclesiastical elements; Salernitan texts; native Teutonic magic and herb lore; Celtic magic; herb lore from Southern Italy; Byzantine magic; Pagan Roman spells. Dr. Singer possesses a wonderful fund of by-ways of knowledge—e.g., he notes in commenting upon Byrhtferd of Ramsey's diagram of the relations of macrocosm to microcosm that the initials of the four cardinal points which are given in Greek, Arcton, Dysis, Anatole, Mesembrios, make the word Adam, and that Adam is called *protoplastos*. This word, says Dr. Singer, is liturgical, and is found in the Mozarabic liturgy but not in liturgies of later Roman origin. The term *protoplasti*, we may add, is applied to the first men by Tertullian, an African father, and the word may have got into the liturgy through the Moors. Altogether, the paper is well worth reading.

RECENT AMERICAN WORKS ON FOOD AND DIETETICS.

Diet in Health and Disease. By JULIUS FRIEDENWALD, M.D., and JOHN RUHRAH, M.D. Fifth edition, reset. London and Philadelphia: W. B. Saunders Company. 1919. Pp. 919. 25*s*.—The outstanding feature of this volume is the attention that has been given to the important question of diet in disease, this section occupying rather more than half of the contents. It is preceded by general considerations in regard to the chemistry and physiology of digestion, the various classes of foods, and the factors concerned in the diet of individual cases. The composition of foods is discussed with some detail, and the now familiar unit, the calorie, and the value of foods based on calorific estimates claim full consideration. The accessory food factors come in for attention, whereas in previous editions their importance was not so much in evidence. As we have implied, however, the value of the work rests largely on the adaptation of a dietary to a patient's needs and comfort as set out in a well-written series of chapters on diet in disease. These will form a useful source of reference to the general practitioner.

Bacteriology and Mycology of Foods. By FRED. WILBUR TANNER, M.S., Ph.D. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. 1919. Pp. 591. 28*s*.—The subject of foods is not directly reached in this volume until the reader comes to Chapter VI., when the proteins, carbohydrates, and fats are considered. The previous chapters are devoted chiefly to bacteriological technique, including one (Chapter V.) with quite extensive sections on sterilisation and disinfection, and a somewhat elaborate reference to the standardisation of tar acid disinfectants based on what is called the "Hygienic Laboratory phenol coefficient," deduced from a modification of the method established by the researches of THE LANCET Commission on the subject in 1909. "THE LANCET Method" is described as an introduction to the modified method of the Hygienic Laboratory (United States Public Health Service). These chapters are succeeded by sections, amongst others, on water hygiene, milk and milk products, the bacteriology and composition of eggs, meat and meat products, food preservation, and, lastly, epidemiology. The section on eggs is one of the most interesting in the book and bears largely on the question of the diagnosis of the age of the egg and the characteristics shown by the stored egg, pickled egg, and so forth, as manifested by transparency to "candling." The coloured illustrations here are a remarkable feature of the book, in giving a faithful portrayal of the fresh and stale article. We agree with the author that the field of food microbiology is a broad one, but he seems to have encountered some difficulty in keeping up a smooth sequence of events within the limits of this publication.

Milk. By PAUL G. HEINEMAN, Ph.D. W. B. Saunders Company. 1919. Illustrated. Pp. 684. 25*s*.—Milk would be a difficult subject to exhaust, but the work in front of us is remarkable in its extensive and intensive treatment of all questions connected with the hygienic aspect of milk-supplies. Laboratory work is outlined describing the important methods for carrying out sanitary milk examinations, and the bulk of the subject-matter is based on a series of lectures delivered in the Department of Hygiene and Bacteriology of the University of Chicago. This course deals with the physical and chemical properties of milk, the biology of milk, including bacteriology, and methods of producing, handling, and distributing milk. Whilst an admirable example of compilation, many of the numerous chapters give direct evidence of original work. The references to enzymes, vitamines, and sterilisation show the author's acquaintance with modern work done upon

these subjects by British authors, as, for example, that of Lane-Claypon, Starling, Halliburton, Harden, Hewlett, Woodhead, and others. Communications which have appeared in THE LANCET are cited in the copious bibliography at the end of each section, and reference to these will show how high British research stands, where the composition and qualities of milk are in question, making our practical treatment of distribution a scandalous discrepancy with our science. The concluding chapters relate to milk products, including condensed and desiccated milks. The author points out the advantages of dried milk, but appears to have overlooked, when he refers to the shipping of milk powder from one country to another, the troublesome property of the fat in full-cream powders sooner or later becoming rancid. This publication will advance its readers in all modern knowledge concerning milk.

Food: its Composition and Preparation. By MARY T. DOWD and JEAN D. JAMESON. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. Pp. 173. 6*s*.—The authors of this book are teachers of household science at the Washington Irving High School, New York, and they deal admirably with a subject of capital importance. The physiology and chemistry of foods are described in clear and simple terms, and the chapters on practical matters, the preparation, selection, and cooking of food, should be most serviceable. Science and practice are here well partnered, and there is set out an excellent course of training in regard to the things that nourish us and how to present them attractively, as well as scientifically, for consumption.

Diet Lists of the Presbyterian Hospital, New York. Compiled with notes by HERBERT S. CARTER, A.M., M.D. Second edition. W. B. Saunders Company. 1919. Pp. 165. 6*s*.—This book affords a useful synopsis of approved diets in pathological conditions. After a consideration of the suitable diets for convalescents, the following series are dealt with: typhoid diets, pneumonia diet, nephritic diet, diet in arterio-sclerosis, gastric diets (including gastric tests), diets for intestinal conditions, diabetic diets, purin-free diets, obesity diets, low calcium diets, convalescent children's diets, followed by a number of miscellaneous recipes in the concluding chapters. Since the compilation is based on the latest studies in all countries of the various subjects entailed, and on the inferences derived therefrom in practice, the book offers a useful source of reference to consultants and practitioners alike.

The Nation's Food. By RAYMOND PEARL, Ph.D., Sc.D., LL.D. W. B. Saunders Company. 1920. Pp. 274. 16*s*.—The chief interest of this work lies in food statistics, but the copious returns given refer mainly to the position of the United States in regard to these matters. The question of the relation of food imports to food exports, as outlined in Chapters VI., VII., and VIII., invites attention, however, on this side, as well as also Chapter V. on "Total Human Food Production." The book brings out clearly the interdependence of nations on food-supplies, as is instanced in the opening section on "The Food Problem." We find here a food map of Europe showing in diagrammatic form where the shortage of production is. The map is marked in four sections as follows: (1) famine conditions, (2) food shortage approaching famine point, (3) serious food shortage, and (4) sufficient present supply, but future serious. It is interesting to note that England, France, Scandinavia, and Spain are placed in the last category, while Russia, Poland, Serbia, and Armenia come under the first section. The book focuses attention upon very important social and economic food problems affecting the health and well-being of the nations at large, and this collection of statistics will be valued coming from an authority who during the war was chief of the Statistical Division of the United States Food Administration under the control of Mr. H. C. Hoover.

Text-book of Meat Hygiene. By RICHARD EDELMANN, Ph.D. Fourth revised edition by JOHN R. MOHLER, A.M., V.M.D., and ADOLPH EICHHORN, D.V.S. New York and Philadelphia: Lea and Febiger; London: J. and A. Churchill. 1919. With 161 illustrations and 5 coloured plates. Pp. 472. 24*s*.—Our impression of the value of this volume to those engaged on meat inspection, expressed in a review of the previous edition, which appeared in THE LANCET of March 29th, 1913, receives answer in the fact of a fourth revised edition being issued. The rules and regulations governing meat inspection of the Bureau of Animal Industry of the United States form largely the text of the chapters, and these rules are a model for other nations. Laboratory methods are clearly described, and, generally speaking, this revision may claim to present the latest knowledge on modern developments of meat hygiene. There is no subject of greater importance to the community than the advanced study of meat hygiene with the view of letting free to that community only sound and wholesome animal food. This book fulfils a well-defined purpose.

JOURNALS.

Tubercle. A Monthly Journal Devoted to all Aspects of Tuberculosis. Vol. I., No. 9. June, 1920.—The Rôle of Heliotherapy in Surgical Tuberculosis is the title of a lecture by Sir Henry Gauvain, which was delivered at Alton to post-graduates, and gives a general survey of the use of sunlight with a well-balanced estimate of its value. In contradiction of Rollier and others, the author assigns the first place to general and local conservative methods and puts insolation among adjuvant means with X rays and vaccines. The psychological value of sunlight is known to all, though some persons are much more affected than others, and this value is no doubt increased when the solar radiation is intentionally directed to therapeutic ends. The local or direct action of sunlight appears to be due to short-waved rays of low penetrative power and is thus limited to the superficial structures; it is potent as a bactericide chiefly in lupus and similar conditions. This direct effect is obtainable in any patient. Not so is the remote or indirect effect which depends not only on the qualities of the radiation, but on the physiological responses of the tissues, the most obvious of which is pigmentation. This factor is regarded as enormously important, for in some unexplained way pigmentation is so closely associated with recovery that it becomes a measure of resisting power and a sign of great prognostic significance. Heliotherapy is also the subject of a series of abstracts in this number. Dr. Holmboe, of Mesnalien, Norway, has combined the method with sanatorium treatment of pulmonary tuberculosis without interfering with the ordinary routine, and is satisfied that under careful dosage the patients benefited. No case suffered any harm, and high fever is almost the only contra-indication. The writer aims at pigment formation, following Rollier, who believes that pigment acts as a transformer of ultra-violet rays into others of greater penetrating power. Reyn, on the contrary, avoids pigmentation as far as possible, because he regards pigment as a barrier converting the beneficial long waves into the short-waved ultra-violet rays, but it is difficult to believe the result of a normal physiological process can be other than useful to the organism.

In a review of the annual report of the Canadian Association for the Prevention of Tuberculosis, attention is drawn to Dr. Dobbie's views on the vitally important question of prevention. It is easy enough to say that the surest way of suppressing tubercle would be to segregate all infectious cases, but we are dealing with human beings, not animals. Dr. Dobbie has a more excellent way. He approaches the matter from the standpoint of the susceptible subjects, dividing them into three groups in order of susceptibility: (1) infants under 3; (2) children over 3; and (3) adults. Infants should be totally isolated from any infective source, be this mother, father, or any other. Surely this course of procedure should not meet irreconcilable opposition. In the case of children over 3 Dr. Dobbie thinks isolation neither necessary nor desirable, since infection must occur sooner or later, and the main thing is to avoid massive infection while immunity is being developed. Lastly, the case of adults needs but little care, the great majority being already infected, but when advanced cases are a danger to others they should be compulsorily detained. There is much to be commended in this scheme.

Dr. Esther Carling contributes a report on cases of Pulmonary Tubercle treated by Artificial Pneumothorax, and this procedure is the subject of a long series of abstracts. The work of the Community Health Station at Framingham, Mass., U.S.A., is the subject of two articles. This great experiment in public health has now been carried on for more than three years and its results will be watched with increasing interest.

THE LANCET.

LONDON: SATURDAY, JULY 3, 1920.

The Annual Meeting of the British Medical Association.

THE Annual Meeting of the British Medical Association is proving a great success: it will have terminated before these words are read, but with its admirable setting at Cambridge, with a President so famous on the highest scientific planes that his official post confers dignity on the body over which he presides, and with a programme in which hard business, high thinking, and judicious levity are aptly combined, there can be no doubt that the meeting will end as it has begun, and form a memorable occasion.

We publish this week a summary of the proceedings at the four sessions of the Representative Body, which lasted four days. From these it will be seen how various were the professional subjects discussed, and how careful the Representatives were in their consideration of the mass of recommendations made by the Council, and of the riders and amendments arising thereout. This thoughtful attitude was well marked in the way in which the Representative Meeting dealt with the Interim Reports to the Ministry of Health from the Consultative Councils. The door was here open to all sorts of mistakes by way of too hasty criticism of avowedly interim documents. It is true that the meeting had before it a careful Report from the Ministry of Health Committee of the Association, but even with such guidance there were many opportunities for allotting general praise or general blame to prominent features of schemes which have been put forward as ideals for trial, and not as concrete proposals for imminent legislation. The opportunities were not taken, but a vote of real appreciation of the Consultative Councils' activities was recorded in terms that will afford Lord DAWSON, as the first chairman of the English Consultative Council, whose findings were under particular consideration, legitimate gratification, and, what is far more important, practical support for the future. The work of these Councils has yet to be done, and the demeanour of reserve was correct, but that it is not habitual with the Representative Body when expressing opinions is well shown by the resolutions passed where all the circumstances could be judged. The Representatives had no hesitation whatever in saying that, whether it were legally or officially inconvenient or no, the contents of remedies administered by the medical profession must be disclosed to the profession; while they turned down the idea of a whole-time State service of medicine uncompromisingly.

The scientific work of the Association was inaugurated nobly by the Presidential Address, appearing substantially at the front of our issue, wherein Sir CLIFFORD ALLBUTT discussed the part that should be played by the universities in the improvement of medical practice and the furtherance of medical research. He brought the history of the great seats of learning, the lessons of liberal education in the past and present, and his intimate knowledge of the medical profession as student, practitioner, psychologist, and professor, all to bear upon his theme; and by showing how directly the treatment of the sick is enlightened and fortified by, even if not based upon the ancillary sciences, he proved that no university can have a nobler faculty than that of medicine, and that no calling demands more universality in its education than the calling of the doctor.

The Teaching of Obstetrics.

AT the last meeting of the General Medical Council, a report on practical midwifery was presented by the Education Committee, and a general discussion took place upon this important subject. It is of course common knowledge that at many of the medical schools the regulations of the Council with regard to the proper teaching of this subject are not being carried out, and that by the major number of the examining bodies they are not insisted upon. At the present time we believe it is only the universities of Oxford and Cambridge which require that the student shall actually receive practical instruction in lying-in wards before presenting himself for his examination in midwifery. Other examining bodies only require attendance on a certain number of cases in the extern maternity department, where the teaching received by the student is often very imperfect, carried out as it is by junior residents or occasionally by a rather more senior registrar. If the teaching of practical midwifery is to be put upon a proper basis the examining bodies must be persuaded to alter their regulations and to require attendance and adequate instruction for every student in a properly equipped intern department; and in order that this change may be brought about it is imperative for the other members of the teaching staffs of the medical schools to recognise that the importance of practical midwifery for the average practitioner is just as great as that of practical medicine and surgery. At the present time the number of the beds, less than one-twentieth, allotted to lying-in cases in the principal London hospitals is absurdly small, and it is impossible in most cases for the obstetric physicians or surgeons, always in a numerical minority, to persuade their colleagues to hand over to their charge the beds necessary for the proper teaching of their subject. The right balance will hardly be struck until all the examining bodies make the bedside teaching of midwifery compulsory.

It is, we fear, little use for the General Medical Council to make recommendations which the examining bodies ignore, and which, therefore, the medical schools do not carry out. The teaching of practical midwifery to medical students in London at the present time is extremely inadequate, as the report from the Obstetrics Section of the Royal Society of Medicine on the teaching of obstetrics and gynæcology to medical students clearly shows. This report has been circulated, we believe, to all the medical schools, but, so far as we are aware, no action has been taken. It is hardly reasonable to hope that physicians or surgeons will give up beds until they are required to do so by the regulations of the examining bodies, while in the present state of

hospital finances the managing committees cannot be expected to enlarge their institutions for this purpose. Still, it is impossible to reiterate too strongly that the teaching of midwifery will never be on a satisfactory basis until all the examining bodies insist upon proper practical instruction being given, and until every medical school has attached to it a complete obstetric department, officered by men adequately trained for teaching and supplied with the necessary number of beds and the requisite laboratories and other requirements not only for teaching but also for research. At the moment infant welfare is in the ascendant, but given a certain limited supply of money and effort it might be better to spend these upon the mothers rather than upon attempting to keep alive unhealthy and delicate children whose ill-health and delicacy are in many cases due to the lack of proper care of the mother before and at the time of her confinement. Of course, any properly equipped obstetric department will have associated with it an infant-welfare centre, and until such departments are instituted in the metropolis the teaching of obstetric medicine, including antenatal care, will remain unsatisfactory.

Consultant Medical Service on a Graduated Income Basis.

DETAILS have recently been made public of an important experiment in providing a complete medical service for the staff and workpeople of a London business house. The experiment was inaugurated on a small scale some time ago by Messrs. THOMAS DE LA RUE AND CO., Ltd., and has met with such success at their hands that the Company is now commending it to other employers. The kernel of the matter is that a number of consulting physicians and surgeons have agreed to treat privately at reduced fees patients sent to them by the Company, the fees to be based upon what is described as "adjusted income." This includes private means as well as salary, one-fifth of the total being deducted on account of a wife and a further one-tenth on account of each child or other dependant member of the household. The fees payable vary from 10 to 60 per cent. of the norm for operations and from 25 to 100 per cent. in the case of consultations and medical treatment, a minimum of a guinea for a single visit being payable in all cases. In order to ensure that cases are not sent to the consultant staff without due cause, a certificate is required in each case from the Company's medical adviser, the patient then going on to the consultant with a voucher stating the proportion of the normal medical fee payable by him. The Company thus constitutes itself as almoner to private practice, relieving the consultant of the onus of making tiresome inquiries. A further proposal is now made with a view to the provision of a great central nursing home for the reception of employees from a number of business houses at reduced fees, it being suggested that a private institution of this kind with a large number of beds could be run at considerably less expense than at present prevails in the smaller nursing homes now available. Mr. STUART DE LA RUE, who holds an official position on the King's Fund and on the Hospital Sunday Fund, states that his scheme has so far received the whole-hearted support of the medical profession.

The Promise of Peat Potentials.

THE scarcity of fuel concerns us all, and, should it get acute, may well give rise to ill-health. This consideration adds a medical interest to a lecture delivered by Professor PIERCE F. PURCELL on the Peat Resources of Ireland before the Royal Dublin Society, and now published by the Fuel Research Board (Department of Scientific and Industrial Research). The story is mainly technical, but conveys clear and simple lessons to the intelligent reader. In a prefatory note the Director of Fuel Research, Sir GEORGE BEILBY, points to the revival of interest in the question of peat now that there is an admitted scarcity of other kinds of fuel. The peat industry requires wide knowledge, perseverance, and a strong financial backing, for its development is capricious, and fortunes have been lost in it. Professor PURCELL points out that though 98 per cent. of the coal used was imported into Ireland in pre-war times, the supply was ample and the price relatively low, but these happy conditions will return no more. The supply is now reduced, while the price is beyond the means of most, and this reduction of fuel and shortage of food helped to increase the severity of the epidemics of influenza which prevailed in the coast towns of Ireland two years ago. It has been claimed that there is less illness in those houses where peat is employed as a fuel. There is certainly less smoke and dirt produced by the combustion of peat, while bread baked by such fuel holds among the peasantry the highest reputation.

The physical properties of peat are remarkable. The material may contain anything up to 95 per cent. of water and still remain a solid. It is interesting to contrast this with milk containing 12·5 per cent. of solids and 87·5 per cent. of water, in spite of which it is a mobile fluid. Most meats contain 70 per cent. of water, but in such cases the water must clearly be in a kind of combination with tissue or substance, although easily liberated from it by heating or cooking. Evidently the rôle and exact location of water in animal and vegetable tissues calls for investigation. Water is the main trouble in peat. In order to produce one ton of air-dried peat it would be necessary to handle 15 tons of raw peat containing 95 per cent. of water. The net calorific value of dried peat, according to Professor PURCELL, would be 6000 to 7000 B.T.U., and reckoning the average heating value of coal at from 12,000 to 14,000 B.T.U. this means that two tons of dried peat are the equivalent of one ton of coal. It should be noted, however, that the mineral matter in peat averages only 4 per cent., while coal may contain anything up to 20 per cent.

The real problem about peat is the economic elimination of its obstinate water contents. Professor PURCELL'S interesting lecture discloses the possibilities of utilising important national reserves to supply our fuel needs, and raises questions of the greatest importance when we consider the vast peat areas in the country hitherto practically untouched. The peat deposits in Ireland, or bogs, as they are commonly termed, cover no less than one-seventh of the area of the country, and already form the entire fuel supply of 62 per cent. of the farming industry. It is to be hoped that this illuminating lecture will so stimulate the coöperation of science and industry as to bring a fund of fuel to the prompt disposal of a necessitous community.

Annotations.

"Ne quid nimis."

THE "TOMES" COLLECTION.

THE Museum of the Royal College of Surgeons of England has received from Sir Charles Tomes, F.R.S., a gift of great scientific value—namely, the microscopic preparations of teeth made by the donor and by the donor's father, the late Sir John Tomes, F.R.S. The collection thus presented consists of more than 1300 specimens of ground or otherwise prepared sections of the teeth of vertebrate animals. The dental anatomy of all forms of mammalian teeth is depicted more fully than in any other collection. The "Tomes" collection, which thus becomes accessible at the Royal College of Surgeons to all students of dental anatomy, will prove of the utmost use to those who are investigating problems in dental structure. Many of the specimens used by Sir Richard Owen in the preparation of his "Odontography" are also preserved in the Museum of the College. The oldest microscopic preparations in the College collection are those made by Hewson in the later part of the eighteenth century.

INDIVIDUAL COUNTY SCHEMES OF MEDICAL SERVICE.

A SIGN of the increasing interest in a better organisation of medical service throughout the country is the effort being made by various counties to formulate medical schemes for local use. Among the most progressive counties in this respect is Gloucestershire, whose County Council reviewed the situation early in 1918 and outlined a scheme, modified in 1919, which has now received the approval of the Ministry of Health. Some 50 "out-stations" will be provided, each to cover a radius of about three miles. The out-stations will be provided and equipped by the County Council primarily for examination and treatment in connexion with venereal disease, tuberculosis, ex-Service cases, school, maternity, child-welfare, and other clinics, for which provision has been made, or may in the future be made, at the public expense. They may also be used by the medical officers for other patients by arrangement with the County Council. Besides the regular staff, consisting of local practitioners, there will be consultants—the visiting staff of the general hospital, and the tuberculosis and venereal disease officer of the County Council—a district nurse, a masseur, and a V.D. orderly and nurse. The out-stations will be opened weekly for attendance by the medical officer, periodically for attendance by consultants, as often as may be necessary for intermediate treatment by the nursing staff, and at such other times as are convenient to the medical officer for seeing his own patients and hospital cases. An ambulance service is also proposed. The expenses will be paid partly by the County Council direct, and partly by the hospital out of sums provided by the County Council. After the first year the advisability of rearranging the scale of payments on a case or attendance basis will be considered in the light of the experience gained. It will be seen that the proposals of the Gloucestershire County Council coincide in important respects with those formulated by the Consultative Council on Medical and Allied Services, which quotes the scheme in its interim report, and the results of their practical application will be watched with the keenest interest by the whole country. The county of Cheshire appears specially alive to the need for a more efficient supply of the ancillary services, and has just issued a statement, prepared by the Local Medical and Panel Committee, of the provision made for diphtheria antitoxin, vaccines, diagnostic and other clinical facilities for the use of the general practitioner. The facilities for pathological diagnosis of venereal diseases, tuberculosis, diphtheria, typhoid fever, *B. coli* infections, dysentery, C.S.F., and malaria available for each rural or urban district are detailed in tabular form. The nearest places where treatment in the form of arsenic injections, antitoxin, vaccines, serums, and oxygen can be obtained are indicated, as are also the districts in which nursing for ophthalmia neonatorum, influenza, pneumonia, and measles is at present available. Of the home counties, one or two are making special efforts to enhance their already established reputations for infant welfare work. Sussex has recently shown its approval of the sanatorium treatment of tuberculosis by sanctioning the purchase and conversion of two large private estates for this purpose at a cost of some £70,000. The London County Council has established a network of clinics for venereal disease, while the Portsmouth district is making a special effort to cope with this problem on even more vigorous lines. Concentration on one special problem by a local authority, pending the entire reorganisation of the medical services of the country, is hardly less desirable than a trial on a small scale of more general changes; both experiments should be productive of useful results. The value of sanatorium treatment, the effect of the establishment of lying-in hospitals on maternal and infant welfare, the best line of attack against venereal disease—all these are problems the solution of which might be worked out regionally by observation and experiment before huge sums of money are spent simultaneously throughout the kingdom. At the same time, there must be no delay in providing all strata of the community with those medical services hitherto enjoyed only by the rich and, in urban districts, the poor.

HIPPOCRATIC FINGERS.

IN a communication made to the Society of Medical Science at Milan,[1] Dr. Vittorio Ronchetti described the case of a girl, 11 years of age, who died in the Ospedale Maggiore from extensive amyloid degeneration of the liver and ascites following a tuberculous spondylitis, and who showed to a marked degree the so-called Hippocratic or drumstick fingers. At the autopsy, besides the amyloid infiltration of the liver and spleen there were a few scattered sclerosing foci of tubercle at the apices of the lungs, the largest being the size of a pea, some fibrocaseous nodules in the glands at the hilus, and dorsal kyphosis from old Pott's disease. There was neither pulmonary cavitation nor bronchiectasis, nor any miliary tubercle. Dr. Ronchetti draws attention to an interesting fact in this case, not easy of explanation—namely, the coincidence of extensive visceral amyloid disease (the liver weighing 2500 g. and the spleen 150 g.) in comparison with the scantiness of tuberculous lesions; that the few bacilli present immobilised in cicatricial tissue or circumscribed in fibrocaseous foci, encapsuled and semi-calcified and incapable of becoming sufficiently active to produce any miliary diffusion, should have acted as possible causative agents of such intense amyloid degeneration. He expresses his inability to give any adequate solution, but pertinently asks whether amyloid degeneration once started may not be able to persist and progress even though the primary disease which determined its origin becomes extinct or reduced to an infinitesimal degree. The condition of the fingers, which must be distinguished from the hypertrophic pulmonic osteoarthropathy of Marie, is also little capable of definite explanation. Its pulmonic origin can no longer be accepted, at least not univocally, and, moreover, neither the existence of broncho-pulmonary or pleuritic disease, nor the production of putrid substances in the organism can represent the only and exclusive cause, since there are many cases of empyema, bronchiectasis, and tuberculous cavitation in which it is entirely absent, and it is not easy to understand why it is frequent in bronchiectasis and rare in tuberculous vomicæ, nor why it should be very common in congenital heart disease and absent in acquired morbus cordis, even after long periods of failing compensation. Dr. Ronchetti states that this is the first time he has met with this condition in amyloid disease of the liver,

[1] Atti della Società Lombarda di Scienze Mediche e Biologiche, vol. viii., Fasc. 3-4, June 27th, 1919.

and for an explanation falls back on the theory of Ferrio, who attributes it to reflex vaso-motor action causing disturbance of circulation and chronic stasis. A curious fact noted by him is that he has seen it disappear in a case of empyema with thoracectomy and the formation of a pleuro-pulmonary fistula after the patient got well. It is many centuries since the Father of Medicine described οἱ ὄνυχες περιτεταμένοι as diagnostic of empyema, but we have yet much to learn about them.

SURGERY ON THE MOVIES.

RECENT improvement in the reproduction on the film of surgical procedures has been rapid. By means of powerful arc lamps it is now practicable to produce films showing all the details of an intricate operation. At the recent demonstration held under the auspices of the Fellowship of Medicine at the House of the Royal Society of Medicine films were exhibited showing the application of the kinema to the various branches of medicine, surgery, and odontology. The value of such films for teaching and demonstration purposes, especially for post-graduate work, was apparent to all. From a description in print it is not easy to follow all the intricacies of such an operation as an inlay bone-graft, but on the kinema every detail is seen as clearly by the spectators as by the surgeon and his assistants at the actual operation. Particulars of a further series of short film demonstrations, to be given on Monday and Friday afternoons at 5.30 P.M., will be found in our Medical Diary. We warmly commend these demonstrations to all who wish to keep in touch with present-day technique.

HÆMOPHILIA IN WOMEN.

A NEW interest has been aroused in the subject of hæmophilia by the work of H. W. C. Vines, who has shown[1] that the condition can be temporarily alleviated by the production of a slight anaphylactic shock in the patient. Although this cannot be used as an emergency procedure, an extended use of blood transfusion has placed in our hands the means of at once arresting hæmorrhage and of replacing the lost blood. The anaphylactic shock method of treatment has now made it possible to perform upon a hæmophiliac, during the period of remission of the disease, any surgical operation that may be necessary without fear of hæmorrhage. The pathology of hæmophilia remains obscure, and all that it is possible to say is that the coagulation time of the blood is so much lengthened that no clot will form upon a wounded surface; which constituent of the blood is deficient remains a matter for speculation. It was not until the beginning of the nineteenth century that hæmophilia was described as a clinical entity, but already by 1820 enough evidence had accumulated for Nasse, professor of medicine at Bonn, to state that males alone were affected and that the disease was transmitted through apparently normal females mated with normal males. This view of the sex-limited character of the disease has been generally accepted since that time, but the rule has, nevertheless, frequently been challenged. The best general account of hæmophilia in English, with special reference to its manner of inheritance, was published by Bulloch and Fildes in Parts V. and VI. of the "Treasury of Human Inheritance," a very valuable collection of monographs issued by the Galton Eugenics Laboratory in 1911. These authors came to the conclusion that none of the recorded cases of hæmophilia in women would bear analysis, since the statements were unsupported by adequate evidence. The whole literature of the subject, numbering 911 references, was collected by them, and it might have been thought that the question was closed. Since then, however, cases of supposed hæmophilia in women have been reported and this has led to a further interesting contribution to the literature by Dr. Constantine Bucura, of Vienna, in his "Hämophilie beim Weibe."[2] Dr. Bucura has collected 202 alleged cases and has subjected them to a critical examination. He finds that almost every known condition in which bleeding, in one form or another, is a feature, has been confused with hæmophilia. The majority of the cases have presented some abnormal hæmorrhage of gynæcological origin and this has been accepted as a manifestation of true hæmophilia, though presenting none of the features which distinguish the disease in the male. Bleedings from the female genital organs are, as Dr. Bucura points out, often difficult to explain. Menstrual blood is deficient in some of the constituents of normal blood, so that normal menstruation amounts to a local hæmophilia of the parts; the balance of the processes involved is easily upset and abnormal hæmorrhage may result, but this does not justify the inclusion of such cases among true hæmophiliacs. There is only one final pathological test for true hæmophilia and that is the measurement of the coagulation time of the blood in the general circulation during a period of hæmorrhage. In true hæmophilia this is increased six or seven times, a degree incomparably greater than is found in any other hæmorrhagic disease. Dr. Bucura finds that no authentic case of hæmophilia in a female has yet been recorded. His conclusions, though negative, are none the less valuable and constitute an authoritative confirmation of the views expressed by Bulloch and Fildes nine years ago.

[1] Quart. Jour. Med., April, 1920.

[2] Hämophilie beim Weibe. Kritische Studie nebst Erörterung der gynäkologischen Blutungen. Von Prof. Dr. C. Bucura. Wien und Leipzig: Alfred Hölder. 1920. Pp. 92. M. 11.20.

TYPHUS IN POLAND.

THE serious increase of typhus in Eastern Europe has given rise to an appeal for funds to send a completely equipped unit to cope with the 250,000 cases of typhus at present known to be actually occurring in Poland alone. The signatories include the Bishop of London, Cardinal Bourne, the Chief Rabbi, Lord Treowen, Lord Stuart of Wortley, Sir Arthur Stanley, Mr. T. P. O'Connor, and, among medical men, Sir Humphry Rolleston, Sir James Cantlie, Dr. William Hunter, and Dr. J. C. McClure. We have already pointed out[1] that the westward spread of typhus epidemics is a matter of grave concern to the rest of Europe and can only be prevented by energetic action. The endemic prevalence of typhus in Poland, the nature of the conditions likely to cause its spread, and the proposed measures for its eradication were considered in the Report of the Inter-Allied Medical Commission to Poland, presented to the League of Red Cross Societies in October, 1919. The excellent proposals of the newly established Ministry of Public Health in Poland were also recorded in the report, and suggestions were made for the development of the Polish Red Cross Society, under whose auspices the present appeal is issued. Donations should be sent to the Princess Sapieha, 45, Grosvenor-square, London, W.1.

THE SYNDROME OF THE GENICULATE GANGLION.

AT a meeting of the Société Médical des Hôpitaux of Paris, M. A. Souques reported a case of a rare and little-known syndrome, characterised by zona of the external ear, facial paralysis, and auditory troubles on the same side, which he termed "the syndrome of the geniculate ganglion." On Jan. 15th a woman felt severe shooting pains in the right external ear and retro-auricular region. She had at the same time headache and malaise. On the 19th she found that the right side of her face was paralysed and that the ear was red and swollen and showed some "little buttons." Almost at the same time as the pains began, three or four vesicles appeared on the upper surface of the anterior half of the tongue. On examination on Jan. 30th there was complete paralysis of the facial nerve, which gave no reaction to the faradic or galvanic current. There were three groups of fading herpetic vesicles—in the antihelix, concha, and fossa of the antihelix. On the tongue were vestiges of vesicles. The pains which had preceded and accompanied the eruption had disappeared and there was no anæsthesia, but pain was provoked on pressure on the right half of the face. Taste for salt and sugar was diminished

[1] THE LANCET, 1919, ii., 741.

on the right side of the anterior half of the tongue. The patient had not noticed any auditory symptoms, but marked loss of hearing was found on the right side. All these symptoms can be explained by inflammation of the geniculate ganglion. It is now recognised that, like the spinal nerves, the facial is a mixed nerve, and that this ganglion corresponds to the ganglia on the posterior roots of the spinal nerves. The sensory root of the facial is the intermediary nerve of Wrisberg, and the sensory branches are the great and little superficial petrosal nerves and the chorda tympani, which is the nerve of taste in the anterior portion of the tongue. An American neurologist, Dr. J. Ramsay Hunt, has exhaustively described the various forms of herpes zoster due to inflammation of the ganglia of the cranial nerves. He has thus mapped out the cutaneous distribution of the facial nerve in cases of inflammation of the geniculate ganglion: the concha, part of the antihelix, the fossa of the antihelix, and the summit of the antitragus. The connexion of the ganglion with the facial nerve explains the propagation of inflammation from the one to the other and the facial paralysis. Similarly, the proximity of the auditory nerve explains the auditory symptoms. However, direct affection of the peripheral ganglia of the auditory nerve (the ganglia of Scarpa and Corti) cannot be excluded. It is well known that the virus of zoster often attacks several ganglia. There may also be zona of the second and third cervical nerves, as there was in a case shown by M. Souques at the Société de Neurologie. The hyperæsthesia of the face and the pain behind the ear, in the case related above, suggest that either the sensory distribution of the facial is more extensive than has been stated, or that other ganglia were affected. A knowledge of the syndrome of the geniculate ganglion, complete or incomplete (zona of the ear alone or with facial paralysis), is of great practical importance. It may explain certain cases of facial paralysis the cause of which has escaped detection. The presence of pain in a case of facial paralysis would suggest this origin. M. Souques is disposed to think that the prognosis of this form of facial paralysis is better than that of other forms, but admits that his experience of it is very limited.

THE CONTRIBUTION OF VULPIUS TO ORTHOPÆDICS.

Professor Vulpius, of Heidelberg, has a more than European reputation as an orthopædic surgeon, which has been earned by good work done in the specialty. Probably he is best known by his publications on tendon-transference and cognate procedures. Although Nicoladoni first introduced the treatment of the deformities resulting from anterior poliomyelitis by transferring the insertion of an over-acting tendon to that of one which is hopelessly paralysed, he did not live to pursue the subject far. To Vulpius belongs the credit of being a leader in the investigation and proof of the applicability of the method, and if at one time it may have seemed that his enthusiasm outran his judgment, yet a good deal was learnt from the wide scope of his labours in tenoplasty. He has now published in a pamphlet of 80 pages[1] the conclusions which are the outcome of his 25 years' practice as an orthopædic surgeon, together with a review of the history, development, and scope of the specialty and the means best suited to carry out its aims. In a series of short essays he defines the lines upon which the treatment of the most important deformities and joint and bone diseases should be conducted. All these chapters are worthy the perusal of everyone who has to deal with orthopædic problems. Orthopædic surgery, which at first was limited to the instrumental treatment of deformities, took on fresh growth when subcutaneous tenotomy was introduced, seemed likely to be swallowed up by general surgery when Lister widened the field of treatment by operative means, but had been mostly reconquered by specialism ere the beginning of the war. The experiences of the war led to a surprising extension of the application of orthopædic methods and induced many of our younger surgeons to study and practise them. Some years ago a great step in advance was taken in Germany when a census of cripples was made and the profession and public were startled to find how much cripple treatment had been overlooked and what a great expansion of means of cure was necessary to cope with the problem. There is crying want of such a census in the United Kingdom, and it is to be hoped that the Ministry of Health will undertake the task as an essential to the organisation of preventive and curative measures. The treatment of cripples of all sorts—tuberculous, paralytic, congenital, rachitic, and others—needs special institutions, specially trained surgeons, special apparatus, and much time. The problems of the pre-war period are still waiting to be solved, and to them has been added the burden of war cripples, including amputees. The need of improvement in artificial limbs calls for the collaboration of the orthopædic surgeon, the engineer, and the limb-maker. It can easily be demonstrated that the early and thorough treatment of the nation's cripples will pay for itself in the resulting improved earning capacity of the patients. There is need of many properly equipped orthopædic hospitals, preferably in the country, where all the most recent methods of diagnosis and treatment would be available. Not only for the pauper are such institutions wanted, but also for those of moderate means, since the greatly increased cost of up-to-date treatment bids fair to put it beyond the reach of all but the very poor or the very rich.

[1] Aus 25 Jahren Orthopädischer Arbeit. Eine therapeutische Orientierung für den praktischen Arzt. Von Prof. Dr. Oscar Vulpius, Heidelberg. Verlag von Urban und Schwarzenberg, Berlin und Wien. Pp. 80. Price M.12.

CARE AND AFTER-CARE IN TUBERCULOSIS.

IN a leading article on Tuberculosis and Residence, which appeared in our issue of Feb. 21st, we discussed some of the economic difficulties in the efficient treatment of a disease so ubiquitous as tuberculosis. The paper under the title of this annotation read by Dr. Stanley Tinker to the Tuberculosis Congress at Leeds was a further practical contribution to the problem of how to make sanatorium treatment more permanently beneficial.[1] Sanatorium treatment fails for two reasons: bad selection of cases and failure to maintain the improved health obtained during absence from home. The former is simply a matter of wise and unbiassed administration. The latter is a huge, and so far unsolved, problem for which after-care committees have been formed and immense and costly settlements are proposed. Care committees are undoubtedly doing good work, but their outlook is, for the most part, too limited, and they are hampered by lack of funds. The proposal to send consumptives to labour colonies to be established for them in healthy country districts, where all the conditions would be conducive to the continued amelioration begun at the sanatorium, would be, as Dr. Tinker says, ideal if it were practical. The Government has promised to create ten such settlements for 200 to 250 men at a cost of £1,000,000. But to provide for the tuberculous sailors and soldiers alone in this way would cost 200 millions, and estimating the civilian tuberculous as low as 200,000, another 1000 million pounds would be required for a complete scheme. "To remove the cases as they occur and to transport them into ideal villages is but to play with the very fringe of the subject." There must, in the first place, be more thorough dealing with the sources of the disease by municipal authorities, and Dr. Tinker thinks that it should be a principal duty of care committees to stir up public opinion and press the borough councils (and the Government?) to do their duty. He rightly says that it is not necessary to wait till the housing problem is dealt with. It is not so much the houses themselves as the dirtiness, ignorance, alcoholism, and other remediable factors associated with industrial areas which are the cause of tuberculosis. Dr. Tinker's alternative to newly created tuberculosis industrial settlements is to leave the consumptives in their homes, but provide within easy reach special workshops where hours.

[1] Medical Officer, June 12th.

ventilation, meal-times, and other conditions are suited to the capacity of the persons employed.

A scheme on these lines is being inaugurated in Wimbledon for the employment of discharged tuberculous sailors and soldiers. The workshops will consist of two parts—one for training and one for permanent employment. It is expected that the men will be trained to be machinists rather than skilled mechanics. This will simplify training, and make the man more or less self-supporting at an early period. Trade-union rates of wages will be paid, and their pension will sufficiently supplement the wages of those unable to work full time. The workshops are to have ample air-space, but Dr. Tinker does not recommend open-sided sheds. On each site there will be a workshop for 30 to 50 men, with a recreation room, dining room, kitchen and managers' office, instructors', implement, and store rooms, lavatory and washing accommodation. It is expected that the output of work will pay the wages of the men, but of course the workshops will be run at a loss, estimated at 30*s*. a head, and the Government has been asked for a grant to cover this deficiency. We shall look forward with interest to see the Wimbledon scheme actually at work. It is certainly much more practicable than a new industrial settlement, which in any case cannot materialise for some years. If borough council and care committee coöperate on the lines of Dr. Tinker's paper we should expect very great results, and in any case the mere adjustment of the work done to the capacity of the consumptive which the scheme should primarily ensure will probably very greatly increase the men's prospect of maintaining the improvement commenced at the sanatorium.

ANTIMALARIAL MEASURES AT TARANTO.

TARANTO, in the hollow of the instep of the Italian boot, has a wonderful harbour; a large deep-water bay, entered by a canal; perfectly secure against submarines. It is also the nearest harbour attainable from England by land on the way to Salonika, Egypt, and the East. It was therefore established in 1917 as a great forwarding port with a large rest camp. The southern part of Italy is very malarious, and Taranto is no exception. Antimalarial measures were taken at once, but those taken proved insufficient, and Colonel J. C. Robertson, C.M.G., C.I.E., I.M.S., Sanitary Commissioner with the Government of India, was sent there to plan and carry out what further measures were needed. Of his campaign he gives account in the *Journal of the Royal Army Medical Corps* for May. He was fortunate enough to travel out with Sir Ronald Ross, and in December, 1917, they planned together the necessary works. Naturally the scheme devised by these experienced officers stood the test of practice. The camp was on a hill at the edge of the sea, with higher ground at the back of it and two marshes lying on its flanks. Colonel Robertson discusses antimalarial methods at considerable length and very helpfully, and his reports will well repay perusal. Here it must suffice to say that, commencing as he did in the winter, he first decided to destroy as many mosquitoes as he could at once while they were hibernating. They had to be searched for in houses, huts, and sheds, a toilsome procedure, which, however, gave a census of mosquitoes, and besides trained the staff to recognise and catch them. The mosquito breeding-grounds were next attacked, first those within the camp and then those in successive circles round it. In the camp area wells, tanks, and cisterns were sealed or drained, all hollows in tree trunks were plastered up, and no breeding-ground then remained within the camp. Next he attacked the inner circle zone around the camp. The wells here were sealed, and pumps installed in lieu, the trees were treated as within the camp, the surface drains were cleared and regraded, all springs were underdrained and their water carried to outfalls in which automatic oil drippers were placed. There remained the more extensive, more remote, outer circle zone. The marshes over a mile from the camp were treated similarly but less completely, the nearer marshes were treated as the inner circle had been. All drains were constantly watched and kept clear of the vegetation which grew up very quickly, wet spots were oiled by hand, and the poor female mosquitoes had nowhere to lay their eggs. The results were eminently satisfactory. Before he began, in the latter half of October, 1917, 32 anophelines were found in the daily search of 11 tents in the camp. In the same weeks of the following year, in the whole of the camp and in three adjacent houses, only 8 were found, while from April 22nd to June 3rd not one anopheline was caught in any hut or tent within the camp. The huts in the camp were also made mosquito-proof with wire gauze, and the effect of all this on the health of the troops was striking, whereas in 1917 among 1500 men there had been 220 malarial cases with 28 invalidings and 6 deaths, in the last eight months of 1918 among 2400 British troops there were only 55 new cases, of which but one was infected in Taranto camp, and among 3000 British West Indians not one primary infection was recorded. On the 1917 liability there would have been, among the 3000, 440 cases, 56 invalidings, and 12 deaths, and among the 2400, 370 cases, 50 invalidings, and 10 deaths. So Colonel Robertson's foresight and judgment may be credited with a saving of 800 cases, 100 invalidings, and 20 deaths, and the debt the troops at Taranto owe to the R.A.M.C. will not even by these figures be fully declared, for they take no account of the large numbers of troops who were always passing through the camp in safety. The paper is illustrated with valuable charts, and its detailed discussion of the principles and practice of malarial prevention make it not only informing but interesting, and a valuable record of a worthy feat of preventive medicine.

ALBEE'S OPERATION FOR CARIES OF THE SPINE.

THE advantages of the free exchange of experiences and ideas between British and American medical men during the war are well illustrated in a paper on the Modern Treatment of Tuberculosis of the Spine by Mr. A. Rendle Short.[1] In conversations with American surgeons Mr. Short was greatly impressed by the glowing terms in which they spoke of Albee's operation for tuberculous caries of the spine. It was described to him as "one of the most gratifying operations in surgery." This seems to be his opinion, too, and he has already performed the operation in four cases, with striking success three times and comparative success once. Yet two of his four patients had been treated unsuccessfully for years by other methods. Albee has used the method since 1912 and described it for the first time in Europe at the International Conference of Surgery at Berlin in 1914. It had already been practised for some years in America at the Mayo Clinic. The operation consists of taking a graft of bone from the tibia, splitting the spines of the vertebræ at the level of the angular curvature, and inserting the graft in the cleft thus made. The spines are split not quite in the middle line, and in addition to the most prominent spine at the apex of the curvature, the four adjoining spines, two above and two below, are also split. When the graft has become welded by firm, bony union to the two vertebral spines above and below the apex of the angular deformity, the five spines form one rigid mass which acts efficiently as a splint. Various modifications of technique have been introduced in recent years, the most important being the use of a semi-circular skin flap to avoid the coincidence of the cutaneous scar with the grafted bone. The operation is subject to the danger, common to all surgical intervention in tuberculous lesions, of spreading the disease. There is also the possibility that the graft may not "take" owing to faulty technique or secondary infection. Dr. Delchef, of Brussels, discusses the operation in *Le Scalpel* of May 1st, 1920, where he states that in 1918 he felt justified by the good results obtained both in Europe and in America to operate on a child of 6, whom he had been treating for two years for Pott's disease in the lower thoracic region. The operation was successful in

[1] Bristol Medico-Chirurgical Journal, March, 1920.

curing the disease, but X ray plates showed a gradual absorption of the graft in spite of extensive contact with spinal bone and without any infection. Such aseptic resorption of the inserted bone is not inconsistent with surgical experience in other parts of the body, but provided that the splint remains in position long enough for the lesion to become healed the method may yet prove of considerable value in certain cases. Mr. Rendle Short believes that, considering the slight risks of the operation and its many advantages, this should be the routine treatment for all cases of tuberculous disease of the spine, with certain reservations, but he has declined to operate in a case in which there were two tuberculous foci in the spine, in another case because several bones and joints were affected, and in a third because paraplegia was present. He also notes that in children under 12 the vertebral spines are so slender that it is difficult to split them properly. This objection holds good for the cervical region at every age. The advantages claimed for this operation are numerous and great. The period of complete recumbency in bed is reduced from 12 or 18 months to two months; the subsequent period during which an apparatus or jacket must be worn is also considerably shortened. And, most important of all, further increase of the deformity is avoided. This operation seems to be particularly suited for working-class patients, to whom the tediousness of more conservative treatment is exceptionally trying. It is probably too early to estimate the proportion of failures to be expected from the procedure, but it appears that non-union of the graft has seldom, if ever, been observed in the absence of gross suppuration. In skilled hands the operation does not involve much shock or hæmorrhage, and it is evidently one which promises to save many patients from disfigurement.

BABY WEEK.

THE scientific tendency to search for and treat only the ultimate cause of such evils as racial degeneration has led to the tracing of a vicious circle from the C 3 adult backwards through the adolescent, the school-child, the infant and its mother, the pregnant woman, and industrial conditions back once more to the young adult. Such continuous reference back leads no further in reform than it does in committee unless a pause is made at each definite stage reached and progress reported. It is satisfactory when the representatives of one section of the public conscience make a stand at one of the stations of the circle and announce their intention of building up a strong edifice of public opinion at a particular point. Four years ago certain people decided that their energies should henceforth be devoted to the care of infants. Realising that endeavour cannot be kept at equal tension throughout the year they formed the National Baby Week Council, to concentrate on an annual effort "to arouse the public to a sense of the importance of infant life, to promote right ideas and ideals regarding maternity and child welfare, to further those methods of safeguarding infant life already existing for its preservation." The welfare of the baby is the particular care of the National Baby Week Council, whose gala week is now being celebrated throughout the country. The fact that a baby's health at birth depends much on that of its mother, and its subsequent development largely on her instructed care, is not ignored by the Council, neither does it lose sight of the fact that a baby is not an end in itself, the chief function of a perfectly good baby being to reach a sturdy maturity. Conferences are being held at Leeds, Manchester, Brighton, Bradford (July 6th), and Wrexham (July 7th), at which the medical speakers will include Dr. C. W. Saleeby, Dr. Eric Pritchard, Dr. H. W. Pooler, and Dr. J. J. Buchan. The subjects to be discussed are widows' pensions, the home and its substitutes, infant-welfare work, and the decay of parenthood. There will also be propaganda meetings, baby shows, fêtes, and mothercraft exhibitions all over the country. There is perhaps no organisation that appeals more to all sorts of men and women than this one, and the latter especially will find congenial occupation combined with social service in the promotion of a firm, plump, and cheerful babyhood. We have no doubt whatever as to the success of Baby Week.

THE SIGNIFICANCE OF YELLOW SPINAL FLUID.

ACCORDING to Dr. Charles H. Nammack,[1] of New York, who discusses the various conditions in which a yellow spinal fluid occurs, the complete Froin's syndrome consists in (1) a spinal fluid which coagulates at once or upon standing; (2) a yellow coloration or xanthochromia; (3) a marked increase in cells and albumin. The coloration appears to be due to the presence of blood pigments, especially bilirubin, and the increased coagulability to an increase in fibrin. In Dr. Nammack's nine years' work at the Meningitis Division of the New York Health Department yellow spinal fluid was found in 96 out of 5801 cases, or in about 1·6 per cent. After excluding 36 cases in which the diagnosis was never confirmed definitely or there was a lack of sufficient data, the cases were as follows: Tuberculous meningitis, 40; poliomyelitis, 13; cerebral hæmorrhage, 3; meningeal hæmorrhage, 1; cord tumour, 1; pachymeningitis, 1; cerebro-spinal fever, 1. A complete Froin's syndrome was met with in only 6 instances—viz., 2 of meningeal hæmorrhage, 2 of tuberculous meningitis, and 2 of poliomyelitis—the rarity of the complete syndrome being attributed to the fact that acute or subacute types of disease were almost exclusively seen. The amount of cerebro-spinal fluid withdrawn in these cases varied from 3 c.cm. to 50 c.cm., and the colour ranged from the faintest yellow to the deepest canary. In the majority of cases the albumin and globulin were considerably increased. Dr. Nammack concludes that in acute or subacute conditions the presence of yellow spinal fluid strongly suggests the diagnosis of tuberculous meningitis or poliomyelitis.

THE MacAlister Testimonial Fund closes to-day (Saturday) and the testimonial to Sir John MacAlister will be presented, in the form of a cheque, at the annual meeting of the Royal Society of Medicine on Wednesday, July 7th, at 4.30 P.M.

WE remind our readers of the Eleventh Annual Meeting of the Oxford Ophthalmological Congress, which will take place on July 15th and 16th, in the University Museum, Department of Human Anatomy. A detailed programme of the Congress will be found in our news column.

MANCHESTER, in common with other provincial centres, has difficulty in forming a nucleus for advanced graduate work. The large influx of students augments this difficulty. Some of the local hospitals, however, have held successful courses open to all qualified men with the object especially of bringing recent work in concise form before local practitioners. The course at the Manchester Royal Infirmary, which began in October, 1919, was continued on successive Tuesday afternoons and ended on June 29th. The members of the honorary staff of the hospital have each given one or two lectures on subjects in which they were most interested, and which were most likely to be useful to general practitioners. The attendance has been good and the course has apparently been appreciated. It is proposed to resume the work in October next.

[1] The American Journal of Medical Sciences, April, 1920.

INDEX TO "THE LANCET," VOL. I., 1920.

THE Index and Title-page to Vol. I., 1920, which was completed with the issue of June 26th, will be published in THE LANCET of July 10th.

THE BRITISH MEDICAL ASSOCIATION AT CAMBRIDGE.

ANNUAL REPRESENTATIVE MEETING.

FRIDAY, JUNE 25TH.

THE proceedings of the session commenced on Friday morning, June 25th, punctually at 10 A.M., in the Examination Hall, with the Annual Representative Meeting, presided over by Dr. T. W. GARSTANG, the chairman.

It was settled to take the agenda in the printed order of the motions, save that certain recommendations of the Council, in reference to the salaries of medical officers of health and their assistants, were relegated to Saturday, when those officers would be represented by their society; and that the Report of the Medical Consultative Councils to the Ministry of Health, the subject of several motions by the Council of the British Medical Association, was set down for debate on Monday.

The Annual Report of the Council, with the balance-sheet for 1919 and the financial estimates for 1920, was then received and adopted, after which the meeting unanimously accepted the recommendation of the Council that the annual meeting of the Association for 1921 should be held in Newcastle-on-Tyne, with Professor David Drummond as President. It was also agreed that the annual meeting for 1922 should be held at Glasgow. In analysing the financial position Dr. G. E. HASLIP, the treasurer, mentioned that the Government had made a payment of £5000 towards the expenses incurred by the Association in respect of the Central Medical War Committee, a sum, however, which met very little more than one-third of the actual expenditure.

Increase of Subscription and Office Salaries.

A recommendation of the Council that on and after Jan. 1st, 1921, the annual subscription to the Association shall be £3 3*s*. for a member resident in any part of the United Kingdom and £2 2*s*. for members resident elsewhere was then considered. To ascertain the feeling of the members, an amendment was voted upon, substituting £2 12*s*. 6*d*. for £3 3*s*., and after debate was lost, when the meeting adopted, by 116 to 22, the recommendation of the Council. The vote was taken by roll-call in order to ascertain to some extent the local feeling of the dissentients. A debate on the necessity of fixing the salaries of certain new officials in accordance with a definite and rising scale led to highly appreciative remarks by the meeting as to the way in which the work of the Association was being done. The motion was withdrawn.

Organisation: The Transformation of the Association into a Federation of Medical Bodies.

Mr. RUSSELL COOMBE, the chairman of the Organisation Committee, brought forward a recommendation of the Council that the Association should take steps to obtain further powers, without altering its present position as an association of individual members, to become, in addition, a federation of medical bodies. It was pointed out that this proposal had been before the Association for some time, notably in 1914; and has now become topical in regard to the Irish Medical Association, which wishes to be legally independent and yet to work in loyal connexion with the Association.

The following Recommendation of Council was adopted:—

That the Representative Body instruct the Council—

(1) To arrange for there being held at an early date a conference of representatives of the oversea branches, especially the branches in the Dominions, with representatives of the Association at home and with representatives of other bodies, if any, who in the opinion of the Council should be invited to such a conference, with a view to arriving, if possible, at a full agreement as to what should be the lines of the proposed new articles and by-laws.

(2) To report further as soon as practicable to the Representative Body on the subject, with, if possible, such draft alterations of the articles and by-laws as the Council may suggest with a view to taking further powers under the constitution of the Association in the way proposed.

(3) To arrange that the draft new articles and by-laws shall *inter alia:* (*a*) Define the classes of organisations to be admissible, whether directly, or by means of nominees, to membership of the Association. Such classes to include any portion of the Association which may incorporate itself separately but also desire admission on the new basis, and to include also medical bodies outside the Association and bodies representative of the allied professions anywhere within the Empire. (*b*) Assign to the Representative Body the settlement of the general conditions of such membership, including decision as to what shall be the minimum numerical backing, within a body seeking to become such member of the Association, which shall render a request for such membership eligible for consideration. (*c*) Assign to the Council the duty of submitting to the Representative Body, with a view to such membership, the name of any body proposing, or proposed by the Council, to become such member of the Association. (*d*) Assign to the Representative Body the decision as to whether any individual body applying shall be admitted as such member of the Association, and if so upon what special conditions, if any, in the individual case.

The Supplement to the British Medical Journal.

A rider to a motion, which had been accepted, adopting the remainder of the Annual Report, under the heading "Organisation," embodied an instruction to the Council to ensure an adequate setting forth of the current work of the Association in the Supplement of the *British Medical Journal* week by week.

A debate ensued in which it was pointed out that the question had been anxiously considered by the Organisation, Propaganda and Journal Committees, and that the implied criticism had already been largely met. The rider was adopted, when it emerged from the speeches that while there was much criticism of the Supplement because it did not contain certain things, there had been very little support of those responsible for the production of the paper in the way of useful contributions.

Professional Secrecy.

On Saturday morning the following motion, brought forward originally on the previous day in slightly different terms, by Dr. Langdon Down, the chairman of the Central Ethical Committee, was adopted, after a protracted debate:—

That having further considered the question of professional secrecy, viewed from the standpoint of the medical profession, and with special regard to venereal diseases, the Representative Body reiterates the opinion that a medical practitioner should not, without his patient's consent, voluntarily disclose information which he has obtained from such patient in the exercise of his professional duties.

A rider to this motion seeking to pledge the meeting to the view that the medical profession "should be placed on the same footing as to professional secrecy as clergy, barristers, and solicitors," was lost.

Secret Remedies.

A recommendation of Council, put forward by the Central Ethical Committee, was adopted to the effect that a registered medical practitioner should not make use of or recommend any remedy of which the principal ingredients are not disclosed. This was preceded by a debate revealing considerable divergence of opinion, it being the opinion of some speakers that there were remedies the composition of which could not be familiar but which were of proved value in illness. The wide use of secret remedies by medical men was put in evidence in a striking and amusing manner by Dr. COX, the Medical Secretary.

Minimum Salaries for Public Appointments.

An interesting debate on this subject took place on Saturday afternoon, the salaries in question being those of whole-time medical officers and assistant medical officers of health. An invitation had been extended to and accepted by the Society of Medical Officers of Health to send representatives of that society to join in the discussion, and accordingly Professor H. R. Kenwood, Dr. W. J. Howarth, and Dr. G. F. Buchan were present. A very large number of amendments were set down.

Mr. E. B. TURNER, chairman of the Medico-Political Committee, said that a certain scale of salaries had been agreed upon by the Society of Medical Officers of Health for their whole-time members. This scale was the subject of recommendations to the meeting from the Council, and had been arrived at, Mr. Turner said, after anxious attention on all sides, and he urged that if the representatives of the society present could make out their case it would be the duty of the association to support them.

An amendment that the recommendations should be referred back to Council being lost, Dr. G. F. BUCHAN explained and advocated the scale as it affected five classes:—(1) Whole-time medical officers of health; (2) whole-time assistant medical officers of health; (3) whole-time senior medical officers in charge of departments; (4) whole-time medical officers employed in departments; (5) whole-time medical officers in hospitals and sanatoriums. The scale of salaries set down for the first class was as follows:—

Population of administrative area.	Proposed minimum salary.
Up to 50,000	£800, rising to £1000 within a period of not more than 5 years.
50,001 to 100,000 ...	£1000, rising to £1200 within a period of not more than 5 years.
100,001 to 200,000 ...	£1200, rising to £1500 within a period of not more than 5 years.
200,001 to 500,000 ...	£1500, rising to £1800 within a period of not more than 5 years.
Over 500,000	£1800.

With, in addition, bonus according to the Civil Service award in force for the time being.

Dr. Buchan, who spoke with clearness and conviction, pointed out that there were three causes of dissatisfaction among his colleagues: their salaries were too small; their duties and responsibilities had been much increased; and there had been no increase in salaries as the result of rise in expenses, except so far as these were met by the war bonus. He pointed out that the scale of fees proposed, which was the essence of the reforms advocated, was the outcome of joint deliberations between the Society of Medical Officers of Health and the British Medical Association. In answer to questions, he said that there were 1400 medical officers of health in England and Wales, of whom about one-third were whole-time officers. He urged the Association to assist them.

Dr. COX pointed out the extreme difficulty in which the business department of the *British Medical Journal* would be put if the adoption of the scale of salaries proposed were followed, as it must be, by the refusal of advertisements from all Authorities which did not accord with the scale. A letter from the Editor of *The Lancet* was read confirming this view, and saying that in such circumstances every advertisement would have to be returned in the first instance to the Authority to ascertain exactly to which class of officer it applied, and how that officer was affected by the size and population of the administrative area.

Dr. H. B. BRACKENBURY said that the practical question was whether the Society of Medical Officers of Health could fight with success the Authorities and those of their medical colleagues who were not in agreement. He instanced Nottingham, using it as an example only because of its particular size, as a city where the whole-time medical officer of health would, under the scale, receive £2400 per annum. Were they to refuse advertisements offering, say, £2200 and ostracise persons who accepted such a salary? Perfectly suitable candidates would come forward in reply to advertisements elsewhere than in *The Lancet* and the *British Medical Journal*, and the Society of Medical Officers of Health and the British Medical Association would suffer from the rebuff. He advocated heartily the increase of the salaries of the officers concerned, and endorsed a later recommendation of the Council that the following definition be adopted:—

Definition.—An assistant medical officer of health is a medical officer duly appointed as assistant medical officer of health by the local authority to assist the medical officer of health in the general administration of the Health Department, and the carrying out of the various Acts, by-laws, orders, rules, regulations, &c., required to be or usually administered by the medical officer of health; the title assistant medical officer of health to be limited to medical officers carrying out these general duties.

An amendment from Newcastle-on-Tyne affirmed that a substantial addition is needed to all public health salaries, but that it is inadvisable for the Association to commit itself further at present.

MONDAY, JUNE 28TH.

The annual meeting of Representatives continued its sittings on Monday, June 28th, Dr. GARSTANG in the chair. The earlier part of the day had been reserved for the discussion of the

Report of the Ministry of Health Committee.

The Report of the Council under "Ministry of Health," presented by Dr. BRACKENBURY, having been approved, Mr. E. B. TURNER, the chairman, presented a Special Report of the Ministry of Health Committee dealing with the Interim Reports of the Consultative Councils on Medical and Allied Services. He described the work of his Committee, which had been specially directed to the fact that the Reports to the Ministry of Health were interim and not final. An amendment to the adoption of Mr. Turner's Report, put forward by Dr. C. A. BUTTAR and seconded by Sir JAMES BARR, asked the Representative Body to see that the general principles of Lord Dawson's Report were more defined; the Representatives had not had time to digest the arguments. With regard to the establishment of Primary Centres as an essential there were differences of opinion.

Lord DAWSON having put before the meeting the purposes of the Interim Report in a clear and convincing manner, the Representative Body adopted a motion, proposed by Mr. BISHOP HARMAN and seconded by Dr. F. W. GOODBODY, that the establishment of Primary Health Centres was the pivotal idea of the changes recommended in Lord Dawson's Report. This attitude was further upheld in the following motions, put forward by the Brighton division and adopted:—

That in order to attain the objects of an ideal system of Medical and Allied Services it is necessary that the prevention of the occurrence of disease as well as the provision for its treatment should be based on the Domiciliary Medical Service, and that general practitioners should be actively encouraged in the practice of both.

That it be an instruction to the Council to consider and make recommendations as to the scheme which could be submitted to the Minister of Health as requisite for an ideal part-time General Practitioner Domiciliary Medical Service on which all other Medical and Allied Services could be based.

The Ideal Health Council.

An interesting debate ensued upon what should be the proper constitution of a Local Health Authority, in the course of which Lord Dawson explained fully the constitution of the Consultative Councils, their function, and their possibilities.

The following resolution was then adopted unanimously by the meeting:—

That the Representative Meeting welcomes the establishment of the Medical Consultative Council and regards it as an important step in affording essential, organised means whereby the medical profession should exercise its rightful influence on the health policy of the nation.

Dr. BRACKENBURY then moved two resolutions taken, and to some extent adopted by consent, from the Report of the Ministry of Health Committee. The first affirmed the principle that the composition of the Local Health Authority in each area should provide for adequate representation of the medical profession residing in the area, while the second was as follows:—

That for each area there should be established a Statutory Medical Committee to be directly elected by the medical practitioners resident in the area; that the administrative expenses of such Committee should be a charge on the funds of the Local Health Committee; that the duties of this Committee should be to appoint the representatives of the medical profession on the Local Health Committee and on any other committees containing such representatives, and to advise the Local Health Committee on any medical matters; and that this Medical Committee should have the right, whenever it thought desirable, to present its views not only to the Local Health Committee, but also to the Ministry of Health and the public.

The resolutions were approved.

At this point also a unanimous resolution was passed against the principle of a Whole-time State Service.

Resolutions were also passed affirming that postage on the notification of infectious disease should be prepaid by the responsible authorities, and that the fees for post-mortem examinations should be raised by 50 per cent. A resolution was also passed that the fees for police calls should be: day calls 7*s.* 6*d.*, night calls 10*s.* 6*d.* And it was suggested that, as to-day the eight hours day was recognised widely while medical men were on duty all round the clock, for the purposes of adjusting higher night fees, night should be considered to run from 6 P.M. till 9 A.M. the following day.

Report of the Medico-Political Committee.

On a general motion for the adoption of this Report two interesting resolutions were passed among others. It was agreed that the fees for medical witnesses should be raised to 3 and 2 guineas respectively, and that the Council should press for the raising of the fee for the notification of infectious diseases to 5*s*.

A debate arose under a motion for the restraint of unqualified practice worded as follows:—

That in the opinion of the Representative Body serious steps should be taken in the public interest by the Association to bring to the notice of Parliament the injurious effects of unqualified practice in medicine and surgery.

In reply to the suggestion that the actions of the British Medical Association in this direction had been ineffective, because the evil had so much increased during and since the war, Mr. TURNER told the meeting that at any rate the Government was now alive to the situation, and that sooner or later legislative remedy might be expected.

Fees for Practitioners Summoned by Midwives.

On a motion that the fees for practitioners summoned by midwives should be amended, Dr. BRACKENBURY said that the difficulty was that while the £2 2*s*. suggested by the Ministry of Health appeared satisfactory in some parts of the kingdom, notably in Scotland, practitioners in many parts of England found the sum insufficient. The following resolution was adopted:—

That the fee of £2 2*s*. suggested in Para. 1 of the Ministry of Health's proposed amended scale of fees for medical practitioners called in on the advice of midwives is too small to enable the Association to urge practitioners to respond to these calls in areas or cases where they are unwilling to do so.

Motions attempting to allot the payment of the fee between patients and the Authority, and to define the period more justly over which illnesses arising out of pregnancy were treated under the responsibility of the Authority, were lost.

TUESDAY, JUNE 29TH.

The proceedings on Tuesday began punctually, Dr. GARSTANG presiding, with a discussion upon the situation of the medical practitioner in respect of

The Vaccination of Insured Persons.

The debate arose out of a resolution, sent up from the Glasgow Southern Division, protesting against the action of the Scottish Board of Health in saddling the profession with the free vaccination of insured persons.

A resolution was passed instructing the Council to obtain legal advice as to whether this service comes within the scope of the agreement with Insurance Committees.

The Limitation of Panel Lists in Glasgow.

A resolution was passed reflecting severely upon the action of the Glasgow Burgh Insurance Committee in attempting to limit panel lists to 1500, in breach of the agreement entered into between the Government and the Insurance Acts Committee.

Public Health and Poor-law.

Dr. Garstang vacated the chair to move the approval of the Representative Body of the Annual Report of Council under "Public Health and Poor-law," and briefly recounted the long and practical help rendered by the Association to the Public Health Medical Service. He called attention also to the vigorous help extended to this work, in their different capacities, by Sir Philip Magnus and Dr. Herbert Jones. The Report was approved unanimously.

The Payment of Voluntary Hospital Staffs.

Dr. BOLAM, Chairman of the Hospitals Committee, submitted the following motion on behalf of the Council, and it was unanimously adopted:—

That for all work for soldiers and sailors, whether discharged or not, for any disease or injuries connected with the war, undertaken at voluntary hospitals, the medical staffs should be adequately remunerated. For the present the remuneration should represent an addition of not less than 25 per cent. to the cost of maintenance of in-patients, and not less than 25 per cent. of the ascertained cost per patient per attendance for out-patients, the additional sum to be placed at the disposal of the medical staff; that in the case of special clinics—e.g., aural and ophthalmic—the fee payable to the medical practitioner should not be less than the fee payable by the Ministry of Pensions for identical or similar services—viz., £2 2*s*. per session.

Paying Patients at Poor-law Hospitals.

A resolution was adopted, asking the Council to arrange for an inquiry and report upon the work of Poor-law hospitals in relation to medical practice outside. During a brief debate it was brought out that there were paying patients who found their way into these institutions, many of which at the present are far from full, and who came accordingly under the care of the medical superintendents, the private practitioners having no access to them.

Paying for Maintenance by Hospital Patients.

The Representative Body adopted a motion—

That the Representative Body is of opinion that the suggested remedy for existing financial straits of hospitals—namely, to demand contributions in aid of their maintenance from the patients, fundamentally alters the basis of the relationship hitherto existing between the honorary medical staffs and the subscribers; and refers the question to the Council for consideration and report.

The Work of the Naval and Military Committee.

Lieutenant-Colonel R. H. ELLIOT, I.M.S., the chairman of the committee, submitted the following as representatives of the Services on the Council for the period 1920–23, and they were duly nominated: Surgeon-Captain Meaden (Royal Navy); Colonel T. D. Barry (Royal Air Force); Lieutenant-General Sir W. Babtie (R.A.M.C.); and Colonel Sir W. J. Buchanan (I.M.S.).

Colonel Elliot then described the work which had been done by the British Medical Association over a long period of years, largely through the assistance of Sir Havelock Charles and Mr. Montague, the Secretary of State, in behalf of the Indian Medical Service. This work, he said, had resulted in raising the Service into a good career.

Sir HAVELOCK CHARLES testified to the work done by the Association in behalf of the medical officers of the Services, and he added that to-day in India a great future awaits the young officer of the I.M.S., but the recruit to that Service must be physically strong and devoted to the work.

Colonel NEEDHAM, Deputy Director-General, I.M.S., said that the British Medical Association's action, while working for reform, had led to a shortage of officers in the Service, and that the logical sequence, now that acceptable terms had been obtained, would be for the Association to recruit for the Service.

A resolution was carried unanimously recording the satisfaction of the Representative Body with the terms now offered to the officers of the I.M.S. Votes of thanks were also passed to the Secretary of State and Sir Havelock Charles.

General Approvals.

The meeting closed with votes of general approval of the annual report and supplementary report of the Council and the election of the new officers and committees.

THE ANNUAL GENERAL MEETING.

The annual general meeting was held, in respect of its first stage, at the Examination Halls, on Tuesday afternoon, Sir CLIFFORD ALLBUTT presiding.

On the evening of the same day the Presidential Address to the Association was delivered in the Senate House, while the honorary degree of LL.D. of the University was conferred upon the following gentlemen:—Sir Clifford Allbutt, Regius Professor of Physic in the University and President of the British Medical Association; M. Jules Bordet, President of the Faculty of Medicine and Director of the Pasteur Institute at Brussels; Dr. Simon Flexner, Director of the Rockefeller Laboratories; Dr. Piero Giacosa, Professor of Experimental Pharmacology at the University of Turin; Sir George Makins, President of the Royal College of Surgeons of England; and Sir Norman Moore, President of the Royal College of Physicians of London.

The ceremony was followed by a reception in King's College, when Sir Clifford Allbutt was presented with the beautiful portrait subscribed for by the members of the Association and painted by Sir William Orpen.

THE MEETING OF THE COUNCIL: RESIGNATION OF DR. MACDONALD.

At the first meeting of the Council for 1920–1921, Dr. J. A. MACDONALD expressed his intention not to present himself for re-election to the office of chairman, an announcement that was received with great regret by this body. Dr. R. A. Bolam, of Newcastle-on-Tyne, was elected in his place. Sir JENNER VERRALL moved, and Dr. T. W. GARSTANG seconded, a cordial vote of thanks to Dr. Macdonald for his eminent services, and speakers representing the medical profession generally in England and Wales, Scotland, Ireland, and the Overseas Dominions, as well as past holders of office in the Association, supported the vote in unqualified terms.

Dr. Macdonald, in a brief reply, explained his resignation as arising out of his feeling that new men should be constantly called upon to serve in these administrative positions in the Association. He thanked his colleagues on the Council for their loyalty to him during his office, pointing out that it was the chairman's duty in the intervals between the meetings of Council to act upon his own initiative, when he had ever striven to make the decisions in accordance with what he believed would have been the sense of the Council in conclave. He concluded by referring to the pleasure that he anticipated deriving from his mission to South Africa in behalf of the Association work.

THE EXHIBITION.

Sir CLIFFORD ALLBUTT opened the exhibition of surgical instruments, drugs, and foods on Tuesday, June 29th. The organising committee are to be congratulated on securing such an admirable building as the Corn Exchange for the purpose. An artistic building, and lofty, with excellent lighting in the shape of an oval glass roof, gave the exhibitors an opportunity of displaying to the best advantage their exhibits. The show was well staged, the tout ensemble was good, and the materials, generally speaking, were of real scientific interest. We doubt if this section of the meeting has come into greater prominence before or attracted more attention.

MEDICINE AND THE LAW.

Does Parental Refusal of Operation Constitute Neglect?

AT the Greenwich police court recently a defendant of foreign origin was summoned for neglecting his daughter, a "young person" 15 years of age, by refusing to allow an operation for adenoids to be performed upon her. At the first hearing it appeared that the father and mother were unwilling to have pain inflicted upon their offspring, that they had been told that the case was not serious, that they regarded the administration of an anæsthetic with apprehension, and were generally anxious, no doubt in good faith, to make all the excuses, and raise all the objections usually heard on such occasions. The magistrate was tactful but firm. After hearing all the evidence and explaining the law to the father, including the nature of the penalties involved, he told him that his attitude was obstinate, stupid, and cruel, and gave him a fortnight to think the matter over. When the adjourned case came up for hearing good advice had had its result. The parents had considered the possibility of the father having to undergo imprisonment if he remained obdurate, and had consented to have the operation performed. It had been performed successfully, so the matter ended happily in the taking of the usual recognisances.

The "calling in a doctor" has no doubt long been realised to be the duty of parents when their children are "ill." This duty has, however, at times been distinguished in their minds from that of having a "surgical operation" performed, and "an operation under an anæsthetic" has seemed to them an alarming step, very different from the administration of drugs. In this attitude they have had a measure of public support. For example, we observe that in commenting upon the case above referred to the *Evening News* said: "Thousands of parents with ailing children will realise with surprise and not a little apprehension that they are liable to imprisonment if they ignore a doctor's advice to have an operation performed." This may indicate the mental attitude of persons who are uninformed upon many other subjects besides their duties as parents; but the law, ignorance of which does not excuse the transgressor, is clear on the subject and in its origin at any rate, older than most of the parents whom it affects. That is to say, the provision of medical aid for children under 14 years of age was first imposed as a duty on their parents by the Poor-law Amendment Act, 1868. No direct reference to medical aid in connexion with the neglect of children was made in the later Prevention of Cruelty to Children Act of 1894 or in an intermediate Act which might have been expected to provide for it. But in 1899, in the case of R. *v.* Senior, in which the Peculiar People were concerned, Lord Russell of Killowen carefully went into the question of this omission, and held that it could not be thought that the legislature intended a step so retrograde as to deny medical attendance to children who had before been entitled to it. He defined the medical aid under discussion as belonging to the class of essential things that reasonably careful parents would provide, and referred to the possibility of occasions arising when the intervention of a surgeon would be included in the treatment necessary. The statute now in force, the Children Act, 1908, includes young persons—i.e., children between 14 and 16 years of age—and, by Section 12, makes it an offence punishable by fine or imprisonment, if a parent (or other person defined as responsible) wilfully neglects in a manner likely to cause a child or young person unnecessary suffering or injury to his health, "including injury to, or loss of, sight or hearing or limb or organ of the body and any mental derangement." The same section adds that a parent or other person liable to maintain a child or young person shall be deemed to have neglected him if he fails to provide "adequate food, clothing, medical aid, or lodging," and further declares that those who cannot themselves procure what is necessary must have recourse to the Poor-law. It will be observed that no obligation is laid upon the medical witness to state with certainty the result of taking or refusing to take any steps recommended, the essential point for the court to consider being whether the alleged neglect is "likely" to cause unnecessary suffering or injury to health. The words quoted which specify injury to sight or hearing, or limb, or organ of the body would be meaningless in connexion with the duty of obtaining medical aid, if "medical" were to be interpreted as excluding all surgical intervention. Attention was called to the bearing of this passage in the section by Mr. Justice Darling in his judgment in Oakey *v.* Jackson, 1914, 1 K.B., p. 216. In that case there was an appeal on the ground that magistrates had wrongly refused to convict, and the operation which the defendant had refused to have performed on his child was for adenoids, so that the Greenwich magistrate had direct authority to guide him. In Oakey *v.* Jackson the magistrates found the facts against the defendant—that is to say, they found that adenoids were causing mental dullness, imperfect breathing, and deafness; that the child was suffering injury to health; and that removal of the adenoids was the only possible remedy. Nevertheless, they had acquitted the defendant, apparently thinking that they had no right to seek to enforce the performance of an "operation," and the Divisional Court ruling otherwise sent the case back to the magistrates for their reconsideration.

An important point, however, expressly laid down in Oakey *v.* Jackson must be borne in mind. Medical men concerned in such cases should note that a refusal to allow an operation is not necessarily such a failure to provide adequate medical aid as to amount to wilful neglect causing injury to health. The question in each case is one of fact to be decided upon the evidence given, and the magistrates must take into consideration the nature of the operation and the reasonableness of the parents' refusal to permit it. "Wilful" neglect in the section has also been definitely

held to mean neglect that is wilful and intentional and not arising through accident or inadvertence. It will be seen from the above that the law on the subject of operations to children has existed for some little time, and that it is clear and comprehensive. The publicity given from time to time to cases which arise under it when parents allow their apprehensions or their ignorance to render their conduct "unreasonable" should have made it fairly familiar to all. There is, moreover, in such cases a right to be tried by a jury, but it must be claimed before the charge is gone into by the magistrate.

The Danger of Headache Powders.

At an inquest held recently at Grimsby the medical evidence attributed the death of a woman to the taking of a "headache powder," combined with a full stomach and heavy clothing. The coroner informed the jury that an analysis of similar powders made for the British Medical Association showed that "a powder" would contain approximately 6·3 gr. of acetanilide. Medical evidence as to the effect of the drug was given, assigning 5 gr. as a dose which might produce collapse. A verdict of "Death by misadventure" was returned by the coroner. It is to be regretted that he did not define the "misadventure." A rider might have been useful to the effect that it was a "misadventure" or "misfortune" for such as the deceased woman that the law should allow the unrestricted sale of possibly dangerous drugs to ignorant persons under the guise of "patent" medicines.

Advertisements in the Medical Press.

The efforts of the Worcestershire County Council to secure ten medical men in connexion with its medical service scheme at salaries of £450 per annum have already been noted in our columns.[1] At a recent meeting of the Council the chairman, Mr. Willis Bund, who was himself one of those who expressed anger at the refusal of *The Lancet* and the *British Medical Journal* to publish the Council's advertisements, had to report to the meeting that advertisements of the posts had been duly inserted in accordance with the Council's instructions by the committee in the lay press. The committee had had many replies to these, but he was obliged to add that nearly all were from persons not suitable for the posts, and that out of the "very small" number who were apparently regarded as comparatively suitable only one could be finally selected for possible appointment. There were, Mr. Bund said, a large number of Irishmen and some Scotsmen among the candidates, but they had not had experience in the class of work which the Ministry of Health required, and he very much doubted whether the Ministry would have approved the appointments. Discussion followed. The Council was advised on the one hand to "put its foot down," and that there were "young men walking the hospitals in London who would be only too glad to accept the salary offered." They were also reminded, not unreasonably, that the posts involved no work at night or on Sundays. On the other hand, Dr. H. E. Dixey, who presented the case from the point of view of the medical profession with clearness and force at the first meeting on the subject, brought to the notice of the Council that salaries such as it was refusing to offer were already being paid in other counties, and that the whole medical service of Worcestershire would be stopped if it did not appoint medical officers. Eventually a motion to give the committee power to go beyond £450 per annum as the salary for the posts offered was carried. The £500 per annum now to be offered as a commencing income can hardly be regarded as the equivalent of more than £250 per annum in 1913. It is better than £450 as a salary with which to commence, and that is all that can be said with regard to it. The Worcestershire County Council, and more particularly those who voted for the increase, are to be congratulated upon having discontinued a struggle for economy at the expense of efficiency, which has had as its result the waste of money spent in useless advertisements and of several months of valuable time.

[1] THE LANCET, May 1st, 1920, p. 979 June 5th, 1920, p. 1230.

NOTES ON HOUSING.

(FROM AN AMERICAN CORRESPONDENT.)

The Problem in America.

NOTWITHSTANDING the estimate of the United States labour department that at the close of the war there was a deficiency of 1 million houses, the problem in America cannot be considered as serious as it is in England. The rate of construction of new houses diminished steadily from 1909 to 1918, and although it has risen since that date there is certainly leeway to be made up. A considerable part of the present tension is due to the influx of workers from country districts to large towns in search of the high wages which were recently offered by war industries. At present there are many houses unoccupied in certain country districts. Housing reformers are confident that in a few years the need for buildings of any kind will have disappeared. Their attention is, therefore, mainly concentrated upon the task of maintaining a high standard of planning and construction in the houses at present being built. In this they are aided by the standards drawn up by Mr. Lawrence Veiller, secretary of the National Housing Association, on March 7th, 1918, and subsequently adopted with some slight modifications by the Housing Bureau of the Department of Labour. The standards, it is said, are not intended as inflexible requirements, but any plans which fail to conform to them are not likely to be accepted unless supported by very strong reasons. The standards are contained in a pamphlet[1] of 15 pages, which should be procured by all interested in hygienic housing, for every detail of construction, and even of furniture, has received careful attention. The paragraph on ventilation gives a fair idea of the general standard.

"17. *Ventilation.*—Every room to have at least one window opening directly to the outer air. Two windows in each room generally preferred; one window sufficient in small bedrooms. Each room to have a window area of not less than 12 square feet.

Cross ventilation as direct as possible to be provided through all rooms, through windows, transoms, or doors; communicating door recommended between front and rear bedrooms in row houses.

Every bathroom to have a window of not less than 6 square feet opening directly to the outer air.

Every water-closet compartment to have a window of not less than 4½ square feet opening directly to the outer air. A skylight in the roof, with an equal amount of glass area and provided with adequate ventilators, will be accepted in lieu of such window, but skylights are not desirable."

The Housing Corporation set a good example when in July, 1918, they were entrusted by Congress with $100,000,000 to be spent on housing. Refusing to construct temporary shelters, the Corporation set to work to build permanent dwellings, and provided not only for ideal planning but also for adequate travelling facilities for the inhabitants. The Corporation has received a good deal of criticism on account of the expense incurred per house—the average cost at Bridgeport, Connecticut, was $7263, but temporary buildings would have cost $2000 and would have been of little "salvage value." More important still, the moral value of the Corporation's activities would have been lost.

A Committee of Women Graduates.

It is impossible for the English visitor in America not to be struck by the attention which the more leisured classes devote to various forms of social service, and by the scientific spirit with which they approach the various problems of social need. This characteristic is well illustrated by the formation early in 1917 of a committee on housing by the Association of Collegiate Alumnæ, a national organisation with a membership of over 8000 women graduates. The committee reported on April 2nd last, and we learn from an article in the current number of *Housing Betterment*[2] that in addition to formulating principles of housing reform "to be attained through restrictive and constructive housing legislation and town planning," they have already

[1] Standards recommended for Permanent Industrial Housing Developments, Department of Labour, Washington, 1918.

[2] Housing Betterment, a journal of Housing Advance. The National Housing Association, 105, East Twenty-second-street New York. May, 1920.

established 46 local housing committees for educational propaganda along the lines determined. The same number of this journal announces that the University of Wisconsin is now offering a course in City Planning and Housing. The course will deal with (1) City Planning; (2) the Housing Problem in General; (3) Industrial Housing; (4) Parks and Playgrounds. It is to be conducted by Professor Leonard S. Smith.

Ourselves—as Others See Us.

It is a salutary exercise to read an American's criticism of our own housing problem and of our methods of dealing with it. The opportunity is given by Mr. F. T. Miller in a pamphlet just published.[3] Some of the criticisms are undoubtedly deserved, though we doubt if Mr. Miller has quite realised how large is the problem with which this country has to deal. Some of the criticisms, as, for example, that precious time has been lost in "discussion of substitutes for unavailable building materials" appear to us to be unfounded. The two most important, however, are worthy of some consideration. It is said that after subsidising the tenant we have now by the Act of 1919 instituted a policy of subsidising the producer. Mr. Miller holds that it is only by subsidising the owner that a proper impetus will be given to private enterprise. He has apparently overlooked the fact that under the present law any private house of the required specifications built before Dec. 23rd, 1920, will receive the full Government subsidy, and that by this arrangement the owner of the house pays £180 less to the builder than he would otherwise have to pay. We grant that this is only temporary legislation, and it may be that a wider and more permanent scheme is desirable. We see, however, an objection to the use of Mr. Miller's incentive of "unearned increment" to tempt the private owner; for unearned increment is most readily acquired on the margins of large cities.

Philadelphia, Pa., U.S.A., June 10th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Scottish Hospital and Nursing Services.

THE Scottish National Health Insurance Commissioners' report on the hospital and nursing services in Scotland has just been issued. It states that the lack of accommodation in voluntary hospitals is mainly surgical, but that it also extends to convalescent treatment, epilepsy, neurasthenia, paralysis, chronic diseases of the heart and respiratory organs, and incurable diseases generally. Many of the smaller hospitals are badly equipped with modern appliances. In hospitals controlled by the local authorities more accommodation is needed for cases of tuberculosis, for infectious diseases in certain thickly populated parts, and for mental cases. There is no evidence that the income of voluntary hospitals is diminishing, but it does not grow in amount sufficient to meet the increased calls. There is need for the greatest economy in utilising and extending the present hospital services. For convalescents and chronic cases use might be made of holiday homes, at present open only during the summer months, and possibly also of some of the auxiliary hospitals at present in existence. The Commissioners draw attention to the present casual relationship between the general and special hospitals, and suggest greater coöperation; they also draw attention to the waste entailed by several hospitals in a centre making separate appeals to the public, instead of combining their efforts. The report pays a tribute to the valuable nursing services rendered, but suggests that the time has come for reorganising in order to obtain better conditions for those engaged in the work, and still further to improve its efficiency.

Small-pox Epidemic in Glasgow.

The outbreak of small-pox in Glasgow as yet shows no signs of abating, and fresh cases are still being reported daily. The disease, however, does not appear to be spreading with any increase of rapidity, as the number of fresh notifications remains about the same—namely, four to six per day. Since its commencement the epidemic has been almost entirely confined to Glasgow, an occasional case only having been seen in other districts. The danger period, however, is just approaching, when the people of Glasgow enjoy their term of holiday. It is customary for them to go in large numbers not only to the West Coast seaside resorts but to many places farther afield, particularly to Fifeshire and to Midlothian. It seems not unreasonable, therefore, to fear that the holiday period may be accompanied by a much greater dissemination of the disease than has hitherto been witnessed.

Edinburgh Royal Infirmary.

The great campaign to raise funds for the maintenance and improvement of the Royal Infirmary has been most energetically carried out during the last few weeks, and the organisation of the appeal certainly reflects great credit upon those undertaking its direction. No effort has been spared to bring it before public notice and to make it a success. The first list of subscriptions, amounting to just over £50,000, bears witness to the many functions which have been promoted in its aid, and to the cosmopolitan nature of those who are endeavouring to render assistance. The remarkable demonstration which took place on May 22nd in Edinburgh and throughout 17 Scottish counties showed the complete unity of all classes in supporting the Royal Infirmary. The Edinburgh demonstration took the form of a grand parade, which commenced from the King's Park at 6 P.M. and traversed all the principal routes of the city. The procession was several miles in length and took about an hour and a half to pass any fixed point. It was certainly one of the largest—if not the largest and most representative—of all demonstrations which have ever been held in Scotland. A gratifying feature was the universal response made by the various trade organisations, friendly societies, and other similar bodies. It was apparent to everyone that an immense amount of trouble had been taken by those participating to ensure the success of the parade. Every trade carried suitable emblems which indicated the particular occupation of the bearers. Many lorries and other conveyances were decorated in comic style and gave rise to much amusement. Prominent among these were representations of patients in bed in typical infirmary garb, X ray apparatus, and various hospital departments and laboratories. The work of the students was much in evidence, and many of their societies, the Officers' Training Corps, and numerous bands also took part. There were a large number of collectors in fancy dress, and the immense crowds of onlookers lining the streets responded in a liberal manner. The unanimity of all classes, and their enthusiasm, provided a remarkable tribute to the high esteem with which the work of the Royal Infirmary is regarded by the public of Scotland. In the course of this month a special appeal has been sent to every householder in Edinburgh, and it is hoped for a liberal response. The sum required in all is a large one—£250,000—and its attainment is essential if the institution is to be kept efficient and up-to-date.

June 29th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

A National Institute of Hygiene.

THE creation of a Ministère de l'Hygiène et de la Prévoyance Sociale by the present Government has brought with it the establishment in Paris of a vast national Institute of Hygiene, which will coöperate with the administrative side of the Ministry in the technical organisation of research work, the propagation of knowledge, and the appointment of officials. The Academy of Medicine has been consulted on these great projects, which have already occasioned much dissension in its ranks. M. Léon Bernard, professor of hygiene at the Faculté of Paris, has submitted to a committee the text

[3] The Housing Situation in England and the United States, by F. T. Miller. F. W. Dodge Company, New York. 1920.

of a scheme which he has formulated, obviously in conjunction with M. Breton, Minister of Hygiene. The institute will have five sections—epidemiology, social hygiene, dietetics, industrial hygiene, and sanitary engineering. Other departments may be foreseen if to this central institute are to be attached other services now spread over different ministries, such as school hygiene, colonial hygiene, and international legislation on hygiene. Each of these sections will have a research department, a teaching department, and probably a corresponding administrative department. The first will comprise the laboratories and all experimental work and statistical inquiries. The teaching will vary in standard according to whether it is addressed to medical students, to graduates who desire to specialise, or to the health staff about to be formed—nurses, health visitors, chemists, sanitary inspectors, and so forth. According to M. Bernard's report, the teaching would be affiliated to the University and would be under his own personal direction as the professor of hygiene of the Faculty. However, M. Delorme, the Inspector-General, has already formulated objections against this centralisation, which he considers unnecessary and costly—the cost of creating new posts and of the staffing of the teaching laboratories would run into some 700,000 francs. He also considers that centres in the districts concerned are more likely to deal understandingly with local problems. Certain conditions of hygiene are found in the north, others in the south, and others in mountainous regions. The needs of naval and colonial hygiene are better appreciated at the ports than in Paris. The provincial faculties have chairs of hygiene which are inspired by local needs and have developed traditions which should not be disturbed. These objections appear sound and will doubtless carry weight, but they do not interfere with the necessity of coördinating all these diverse efforts; this can only be achieved by a national institute attached to the Ministry of Hygiene and situated in the capital. The results of researches and inquiries made by departmental committees must have an official focus if they are to give rise to the formulation of useful general regulations. In a word, while it is desirable that work should be undertaken wherever it can be usefully performed, the practical application of the principles which emerge is only possible under a single authority. It is necessary to decentralise research and to centralise organisation. This is certainly the spirit of the new Ministry of Public Hygiene. Parliament cannot be said to have stinted this Ministry of money, since at a time of rigid economy it has even allocated a sum in excess of the Minister's demands.

A Giant Nursery.

Professor Pinard, now a Deputy for Paris in the new Chamber, has prepared a scheme for the adaptation of the asylum for the insane, called Asile Nationale de Charenton, into a nursery with room for 1500 children with their mothers. The aim is to establish the most modern and the largest school of puericulture in Europe. The inmates are to be removed before July 31st to give place to the infants. M. Breton, Minister of Hygiene, has recently confirmed the news, and has explained his reasons for adopting the scheme. During last year and these last few months thousands of children have died from lack of care. The maternity hospital and all the lying-in and convalescent homes were filled. The sick could not be kept there. Statistics show figures of infant mortality which are really alarming, and the creation near Paris of an institution of modern puericulture has become urgent. The more serious patients can remain at Charenton for two months, and 9000 children a year should thus be saved. This would make it well worth while to have moved 400 of the insane into the country, where the departmental asylums have 1200 vacant beds. The papers say that this giant nursery will receive patients from August, but the alienists are not accepting without protest the suppression of the most important of the institutions of their specialty in the Paris district. Under the leadership of Dr. Antheaume and Dr. Toulouse an effort was made by many Deputies to wreck the enterprise in the Chamber. They made the point that the Charenton Asylum only accepts paying patients whose relatives have an actual claim upon the administration, and will not allow their friends to be transported away from Paris without their consent. They also object on the score of the expense originally incurred in the adaptation of Charenton Asylum to its purpose, which will be a dead loss; further, they question the advisability of such a vast conglomeration of children.

June 28th.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Colpoplasty from the Ileum.

THE problem offered by malformation or complete absence of a vagina in an otherwise healthy female not infrequently presents itself to the surgeon. Professor Waibl demonstrated at a recent meeting of the Gesellschaft der Aerzte of Vienna a case in which he succeeded in obtaining an excellent result in a female, aged 26, by the following method. The patient, a well-developed healthy girl, had no vagina and desired to marry. Professor Waibl first made a channel between rectum and bladder up to the peritoneum. Then an abdominal section was performed; 12 inches of the lower segment of the ileum were separated, short-circuited, and lateral anastomosis performed. The piece of gut was removed, both ends being carefully closed, and was doubled on itself and then pulled down into the pre-formed channel, perforating the peritoneum. Having closed the abdominal wound, the surgeon fixed the apex of the portion of ileum pulled down to the opening of the artificial channel with silk sutures. The lumen was opened with a Paquelin cautery, and the result was an introitus vagina, patulous for one finger. This was dilated with laminaria for several weeks. The vagina was thus at first a double channel, but usually one of the portions gets wider, while the other narrows down so as not to be palpable. At present the canal is wide enough to admit two fingers. The secretion from the artificial canal is insignificant and not irritating to the vulva. Several methods have been devised to produce a functioning vagina, but the use of the colon or rectum is not so satisfactory. Care must, of course, be taken to use only healthy intestine.

Therapeutics and Pathology of so-called Grippe.

At a recent meeting of the Vienna Medical Society a discussion took place on the pathology and treatment of the severe epidemic of encephalitis lately prevalent in the city. Sometimes lethargic and sometimes choreiform in its manifestations, the term "grippe" has been generally used to designate it, leaving open the question of its precise ætiology. Dr. Neuda spoke of the results of his investigations, which suggest that the chief attack of the disease is directed against the peripheral circulatory system. He studied chiefly the convalescent stage, which showed the following prominent symptoms, all pointing to irritation of the vaso-constrictor system: (1) extreme dilatation of the pupils, which are most susceptible to weak cocaine solutions; (2) an "anæmic exanthem" on the wrist, the forearm, and the dorsum of the hands persisting for weeks, similar to the disseminated œdematous spots in the brain seen in cases of encephalitis; (3) extreme anæmic dermography; and (4) severe salivation. Similar symptoms occur after extensive burning, also caused by irritation of the peripheral system. Dr. Neuda supposes that the constrictor condition manifested in convalescence is due to a dilated paralysed condition of the blood-vessels during the disease. As regards treatment, good results have been obtained by intravenous injections of a 10 per cent. aqueous solution of a combination of chloride of calcium and urea, staphylococcal vaccines, and horse serum, and hot baths have also been useful. Investigations conducted by Dr. Pollak and Dr. Pfeiffer showed that strychnine did not have the desired effect of raising the blood pressure for a protracted period. More effect can be obtained from caffeine or adrenalin, the

latter being less reliable. A combination of camphor with papaverin gave excellent results; the latter remedy acts directly on the coronary vessels and the heart itself, and has a useful sedative effect. Professor Schlesinger advocated the use of a combination of 5 c.cm. of a 1 per cent. solution of chloride of calcium in physiological NaCl solution, with 1 cm. of digipuratum; daily injections were found very useful in the cases of malaria complicated by grippe. Dr. Epstein gave details of a case of grippe affecting a 31-year old doctor, who died about a year after having suffered from the disease. His peripheral vessels, chiefly of the abdomen, showed severe defects of the muscular coats, proliferation of the interstitial tissue of the intima, and atheromatous changes. In the coronary arteries the media was partly calcified, as well as the elastica interna, with the proliferation noticed above. It seems that during the grippe necrosis of the contractile and elastic elements of the peripheral vessels takes place.

Death of Professor Kretz.

A few days ago Professor Kretz, one of the last living pupils of Kundrat, died after a protracted illness. He was born in 1865, and after studying in Vienna, became the professor of pathological anatomy in Prague and later in Würzburg. His investigations were directed to the physiology and pathology of the liver, and dealt also with diphtheria and serotherapeutics. His papers on antibodies and immunity, on disturbances of metabolism and the pancreas, as well as on embolism of the lung, are most instructive and afford a clear insight into the problems of these conditions. Although ill for many years—he had given up public work as teacher and returned to Vienna—he volunteered at the beginning of the war to serve in military hospitals, and was one of the leaders of the sanitation campaign which succeeded in stamping out war-born diseases from the "hinter-land." His death, though not unexpected, came as a severe shock to his numerous friends and pupils.

June 18th.

MEDICAL GOLF CHAMPIONSHIP.

THE Medical Golf Championship for this year was played for on the course of the Northwood Golf Club on June 24th, and was won by Mr. R. R. Cruise, with the score of two up on "bogey," winning at the same time THE LANCET Challenge Cup. Mr. T. H. P. Kolesar was awarded the Henry Morris Challenge Cup and the gold medal of the Medical Golfing Society for the score of five up on "bogey." In Class I., for players with handicaps of seven and under, the first prize was taken by Mr. Kolesar, and in Class II., for handicaps of eight and over, the first prize was gained by Dr. G. E. Haslip.

THE LANCET Challenge Cup, held by Mr. R. R. Cruise, the medical golf champion for the year 1920. Dr. M. J. Bulger was champion in 1914, since when the contest has been in abeyance.

Public Health.

REPORTS OF SCHOOL MEDICAL OFFICERS.

Northampton.—In this county borough the groups of children systematically examined have hitherto comprised only the entrants and the leavers, and cases specially brought forward as needing medical care. From the present year onwards the intermediate group of children from 8 to 9 years old will also be systematically examined according to the usual practice. The total number of entrants and leavers so inspected in 1919 amounted to 3059. Amongst these only one case of definite pulmonary tuberculosis was discovered, and only 35 cases of defective nutrition. In 1918 there had been two epidemic "waves" of influenza, and in 1919 a third wave caused 873 cases among the school population, of which 790 were reported in February and March. The condition of Northampton children as regards vaccination is remarkable. In 1918 the percentages vaccinated of the particular ages 4, 5, and 6, were found to be 12·85, 15·06, and 18·87 respectively; in 1919 these percentages were only 9·00, 10·72, and 11·05 respectively. No provision is made for the adequate teaching of dull or backward children, "and they are at present compelled to waste much of their time in school." Neither is any provision made for open-air education. Dr. G. H. Skinner, the school medical inspector, dwells on the importance of this, which has been conclusively proved to be of the greatest and most lasting benefit to the majority of children. There is a sanatorium school for active tuberculosis cases, and with assistance given by the Northampton Crippled Children's Fund most of the children afflicted in this way are able to attend school comfortably, being provided with the necessary appliances. A special report by Mr. F. E. Ward, the organiser of physical training, furnishes interesting details as to the procedure adopted. He emphasises the importance of "a daily lesson of at least 20 minutes actual physical exercise in pure moving air"; he advocates Rugby football for boys and cricket for girls. From a return as to the employment of school children out of school hours, it appears that 613 boys and 203 girls do work of various kinds, chiefly going on errands (477 children), and delivering newspapers (136); 170 children work before school hours; 147 work after school hours; 30 children work before school hours, *also* during the midday interval *and* after school hours; 727 children work on Saturday in addition to other days. "It will be obvious from the above that the by-laws regarding the employment of children of school age are more honoured in the breach than in the observance." The Employment of Children Act, 1903, as amended by Section 13 of the Education Act, 1918, came into force on April 1st, 1920. A new set of by-laws will therefore be necessary, and Dr. Skinner "would urge that the employment of children before school hours be not permitted, and that the by-laws be strictly enforced." If the Northampton ratepayers could be brought to understand that a great deal of their money is wasted in the endeavour to teach children, whose capacity for being taught must be materially diminished by fatigue, due to the work they have to do out of school, there would probably be little opposition. The number of necessitous children fed has fallen from 160 in 1917 to 109 in 1919, and the total number of meals supplied from 70,701 to 41,659. The dietary is excellent and varied. Much good work has been done at the school clinic, where 2891 defects were treated (with 2521 cases), mostly the usual skin, eye, and ear affections. There was a considerable increase in scabies, and it is to be hoped that the recommendation that hot baths should be available at the clinic may be carried out. The difficulty in getting children to wear glasses when they have been prescribed is referred to: "Not unnaturally many children dislike wearing spectacles, and the facility with which they are forgotten or mislaid or lost is remarkable." As a routine procedure a letter has been sent to the head teachers of all children who have been provided with glasses, asking their help to ensure that they are regularly used.

Scarborough.—At Scarborough 1875 children were examined in the code groups during 1919 and in addition 325 special cases. An important but disquieting statement is made by Dr. C. J. W. Tatham, the school medical inspector, as to the increasing neglect of vaccination in this town, which has hitherto held a high reputation as a health resort. Among the children of 12 years of age examined the percentage bearing successful marks of vaccination was 53·64 in the boys and 49·31 in the girls. Among those of 8 years the percentages were 31·22 and 29·14, while in the group of entrants only 26·79 per cent. of the boys and 25·46 per cent. of the girls showed successful marks. For children of all ages taken together the successful vaccinations (which in 1910 had been 44·77 per cent. in the boys and 44·42 in the girls) had fallen to 35·41 and 33·46 per cent. respectively. On the other hand, of 267 special entrants of all ages (newcomers to the town) the proportions of successfully vaccinated children were 66·40 and 61·26 per cent. respectively. As Dr. Tatham points out, "the protection against small-pox afforded by vaccination is being increasingly neglected in Scarborough, the younger children showing the smallest percentages of successful vaccination. ..... The marked neglect of vaccination here indicated may prove of grave significance should small-pox become epidemic in this part of England." If the children in question were to pass all their lives in Scarborough they might conceivably not be injuriously affected: but if their avocations call them to other parts of the world where they may, or indeed will, be in danger of infection, the generation that is growing up will certainly not arise and call their parents blessed. Of course, infection might be introduced into Scarborough any day, with consequent epidemic spread among the unprotected child population. The resulting loss of life in the children and of prosperity in the town can be imagined. The state of nutrition of the school children has not been injuriously affected by the war conditions of the past five years; in 1913 the proportion found to be actually badly nourished was 1·06 per cent., while 16·28 per cent. were considered to be subnormal; in 1919 these proportions were 1·01 and 5·54 per cent. respectively. "Salaries and wages have risen, there has been less unemployment, less poverty, and these have resulted in more food and better clothing." A very satisfactory feature is that "the increased amount of money available has to a large extent been spent on the children." The figures for clothing and for footwear are also considerably better than in 1913; 2·83 and 2·03 per cent. unsatisfactory, compared with 6·94 and 6·73 per cent. On the other hand, war conditions entailed the rationing of food, and it appears that in place of such valuable foods as milk, butter, and eggs substitutes have had to be used, with deficiency of vitamine constituents; and that this has led to spread of tuberculosis, influenza, and increased susceptibility to infectious disease. There were 222 cases of diphtheria with 28 deaths, a continuation of the prevalence in 1918; a large number of cases occurred among girls at the Gladstone-road school in November and December; all the girls were swabbed (353), and 55 were found to be bacteriologically positive. The department was closed for a fortnight before the Christmas holidays, and no more cases occurred. No drainage defects were discovered, but a "general dustiness" was complained of. It was arranged that all woodwork, desks, chairs, &c., should be wiped over with damp cloths soaked in cresol solution after the rooms had been swept and cleaned. With regard to the employment of children after school hours, as Scarborough is not an industrial town, there are not very many children affected; in 22 cases detrimental results were reported by head teachers. Although the situation and surroundings of Scarborough do not appear such as to make an open-air school a necessity, in view of some increase in tuberculosis, Dr. Tatham recommends the establishment of such a school for children that are physically defective. Much good work has been done in the dental department, where 1960 children have been examined and 1204 treated. As to the remedying of defects generally, the results have been most satisfactory. Out of the whole number (1486) treatment has been carried out in 92·79 per cent. of the cases.

URBAN VITAL STATISTICS.

(Week ended June 26th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had declined from 13·8 to 10·6 in the six preceding weeks, further fell to 10·1 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 10·3, or 0·3 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 4·5 in Enfield, 5·1 in Swindon, and 5·4 in Eastbourne and in Oxford, to 16·7 in Great Yarmouth, 16·8 in Exeter, and 19·1 in West Hartlepool. The principal epidemic diseases caused 200 deaths, which corresponded to an annual rate of 0·6 per 1000, and comprised 69 from infantile diarrhœa, 50 from measles, 40 from diphtheria, 33 from whooping-cough, 7 from scarlet fever, and 1 from small-pox. Measles caused a death-rate of 1·6 in Swansea, 1·8 in Leicester, and 2·0 in Great Yarmouth, but the rates from the other diseases showed no marked excess in any of the towns. The fatal case of small-pox belonged to East Ham. There were 1668 cases of diphtheria, 1646 of scarlet fever, and 3 of small-pox under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1705, 1654, and 5 respectively at the end of the previous week. The causes of 14 of the 3455 deaths in the 96 towns were uncertified, of which 6 were registered in Birmingham and 2 in Middlesbrough.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 13·6, 12·7, and 13·3 in the three preceding weeks, fell to 11·5 per 1000. The 266 deaths in Glasgow corresponded to an annual rate of 12·5 per 1000, and included 15 from infantile diarrhœa, 5 each from small-pox and measles, 3 from whooping-cough, 2 from diphtheria, and 1 each from enteric fever and scarlet fever. The 74 deaths in Edinburgh were equal to a rate of 11·3 per 1000, and included 3 from diphtheria and 1 from whooping-cough.

Irish Towns.—The 116 deaths in Dublin corresponded to an annual rate of 14·6, or 2·5 per 1000 below that recorded in the previous week, and included 4 from whooping-cough, 2 from infantile diarrhœa, and 1 each from enteric fever, measles, and diphtheria. The 109 deaths in Belfast were equal to a rate of 13·8 per 1000, and included 2 from whooping-cough and 1 each from scarlet fever, diphtheria, and infantile diarrhœa.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Cmdr. W. H. Daw placed on retired list at own request.
Temp. Surg. Lieut. A. W. McRorie transferred to permanent list.
Lieut. A. H. J. Stokes placed on retired list at own request.

ROYAL NAVAL VOLUNTEER RESERVE.

J. H. Garner-Howe reinstated in R.N.V.R. as Surg. Lieut. Comdr.
Surg. Cmdr. F. W. Smith placed on retired list.
The King has conferred the Royal Naval Volunteer Reserve Officers' Decoration on Surg. Cmdr. H. Reah.

ROYAL ARMY MEDICAL COLLEGE.

Lieut.-Col. J. C. Kennedy, R.A.M.C. to be a Professor.

ROYAL ARMY MEDICAL CORPS.

Major A. B. Smallman relinquishes the temporary rank of Lieutenant-Colonel.

Temp. Major C. H. G. Ramsbottom relinquishes the acting rank of Lieutenant-Colonel.

Temp. Capt. A. W. Willcox relinquishes the acting rank of Major on ceasing to command troops on a hospital ship.

Temporary Captains relinquishing the acting rank of Major: J. A. C. Roy, H. L. Neil, W. H. Hardy, T. C. Ritchie, R. E. H. Leach, R. MacDonald.

Capt. A. N. R. McNeill to be temp. Major whilst specially employed.

Capt. G. J. Keane retires, receiving a gratuity, and retains the rank of Major.

To be Captains: Capts. (from Special Reserve) J. W. Cannon, D. H. Murray, A. K. Robb.

Capt. H. G. Dresing, late R.A.M.C., to be Captain.

Temporary Captains to be Captains: E. Underhill, W. Millerick, J. V. McNally, J. S. K. Boyd, C. M. Forster, J. H. Sharpe, L. M. Rowlette, D. J. MacDougall, D. Crellin.

Captains, from Special Reserve, to be Lieutenants and [to be temporary Captains: J. R. S. Mackay, W. L. M. Gabriel.

Officers relinquishing their commissions:—Temp. Major O. Challis (retains the rank of Major). Temporary Captains granted the rank of Major: L. Meakin, G. D. McLean, E. L. Mackenzie. Temporary Captains retaining the rank of Captain: P. G. A. Bott, F. De C. Keogh, D. Craig, J. W. Edington, G. M. Bluett, J. L. D. Lewis, J. F. Nicholson, K. D. C. Macrae, J. R. Mitchell, B. M. Carruthers, Temp. Capt. J. P. Mitchell (Captain, R.A.M.C., Spec. Res.).

ROYAL AIR FORCE.

Capts. C. F. Eminson, A. A. Wilkinson, and M. Hocken are transferred to the unemployed list.

Correspondence.

"Audi alteram partem."

THE PELLAGRA OUTBREAK IN EGYPT.

To the Editor of THE LANCET.

SIR,—In a paper appearing in THE LANCET of May 8th under this title Dr. J. I. Enright gives an account of pellagra amongst German prisoners of war in Egypt with observations upon the food factor in the disease. This contribution is of great interest with respect to several clinical points and very important in its bearing on the fundamental question of the ætiological nature of the disease. It is this latter phase alone that I desire briefly to consider. As the results of his study in relation to the causation of the disease he concludes (p. 1003) that a "food deficiency" can hardly be considered as of paramount importance. In his view "a critical analysis of the diets which these German pellagrins ate before capture and during their period of captivity prior to the onset of the eruption is sufficient to explode the food-deficiency theory as a predisposing factor. These diets were ample, both in quantity and quality, for any possible requirements, and were of such varied composition that it is perplexing to understand how they could have been improved." If, as Dr. Enright reports, these German pellagrins actually *consumed* before capture and during their period of captivity prior to the onset of the eruption diets that were ample both in quantity and quality for any possible requirements, then it must be granted that the "food-deficiency" theory is, indeed, exploded. Evidently the question upon which the validity of this conclusion depends is: "Did these prisoners actually eat the adequate diet that Dr. Enright believes they did?" Let us examine the facts presented by Dr. Enright and see.

First of all it may be well to note that the great majority of the 7000 to 8000 German prisoners, amongst whom a total of 65 cases are said by Dr. Enright to have occurred, were captured either in September or early November, 1918. The monthly incidence of the disease is stated to have been as follows: January, 13 cases; February, 11 cases; March, 12 cases; April, 14 cases; May, 4 cases; June, 2 cases; July, 7 cases. Certain details with respect to 32 of the 65 cases are presented in a table, from which it appears that in 2 of these 32 cases the period of captivity before onset of the rash was 2¾ months; in 3 it was 3¾ months; in 13 it was 4 to 4¾ months, and in 14 it was 5 to 6¾ months. No information as to this interval is given with respect to the remaining 33 cases, with the exception of two German East African cases, who are stated to have been in Maadi Camp, Cairo, for 13 months prior to the onset of the rash. In the absence of any statement of any shorter period it would seem fair to assume that the shortest period of captivity before the onset of the rash was that given in his table—namely, 2¾ months. This is important, and should be kept in mind in relation to the points next to be considered.

On the theory of "dietary deficiency" there must, of course, be some period of deprivation before the clinical onset of the disease. As to the duration of this period the available knowledge is unfortunately very meagre. In the experimental cases in Mississippi convicts[1] mild subjective symptoms were definitely recognisable before the end of the second month, but the rash did not begin to appear until the close of the fifth month. This experience, however, is probably not altogether typical, for certain more recent observations by the writer, made in association with W. F. Tanner (unpublished), make it highly probable, if not certain, that this period may be as short as three months. Under these circumstances it becomes evident that the diet to be studied in relation to the cases of pellagra amongst the German prisoners is that which they ate after, not that before capture. When we attempt to do this we find that Dr. Enright gives us no account of the diet *actually eaten* by the pellagrins during the period subsequent to their capture and prior to the onset of the pellagrous rash. He does, indeed, give an account of the diet of the pellagrins before capture, but the "diet after capture" is simply that with which the prisoners in camp and hospital were presumably *furnished*, not what those who developed pellagra had *consumed*. Dr. Enright evidently assumes that the pellagrins ate the diet as furnished. In connexion with a point of such crucial importance, however, this assumption is not permissible, as general experience with the vagaries of racial and individual taste in relation to foods, methods of preparation, seasoning, &c., and the literature of scurvy and beri-beri impressively teach. Interestingly enough, however, Dr. Enright himself, quite unconsciously, presents evidence that strikingly illustrates the danger of fallacy involved in the assumption under consideration. He states (p. 999) that "two [of the patients] had had symptoms of scurvy before the rash [of pellagra] appeared." Now, if Dr. Enright's assumption is allowed in relation to pellagra, it must, of course, be allowed in relation to scurvy; it would thus follow that a "food deficiency" can no more explain the origin of scurvy than it can, according to Dr. Enright, explain the origin of pellagra in these men, and consequently the "food-deficiency" theory of scurvy must be considered as "exploded" equally with that of pellagra. Far from being "exploded," however, the food-deficiency theory of scurvy was never more solidly established than at present. It follows, therefore, that the diets allowed the German prisoners were (1) not "ample both in quantity and quality for any possible requirements"; or (2) not distributed as prescribed; or (3) not eaten as furnished them.

Since the number of cases of scurvy and of those of pellagra were relatively very few, it is fairly certain that the diet allowed was adequate so that such faults as developed were probably the result either of improper distribution or of individual eccentricities of taste or, perhaps, of both. In this connexion it may be recalled that prior to capture these German prisoners are said to have lived on "the fat of the land," so that it seems not at all improbable that at least some of them did not find the prison camp diet furnished them after capture physiologically adequate, though it may have been altogether to their liking, leading such either to reduce their normal total intake or to reject certain, to them, objectionable (because of character, flavour, seasoning, mode of preparation, &c.) articles. That a "food deficiency," leading to such condition or conditions as scurvy, war œdema, beri-beri, or pellagra, should thus arise is no more than might be expected, particularly in such as might at the same time be suffering from a depressing illness or mental aberration.

From the foregoing considerations it is evident that Dr. Enright's conclusion that the food-deficiency theory of pellagra is exploded is not well founded, and it follows, further, that the "toxin hypothesis" which Dr. A. D. Bigland[2] felt it necessary to advance in explanation, seemingly, of Dr. Enright's cases, would appear to be superfluous. In this connexion brief reference may perhaps be made to Dr. Viswalingam's paper[3] mentioned in the editorial on "Pellagra and Diet" in THE LANCET of May 8th (p. 1019). It appears that from his observations Viswalingam was "led to conclude that faulty diet in itself cannot cause 'pellagra,' and that there is a superadded infection." For, he argues, "if diet should be the sole factor, then the affected individual should improve, and there should be no recurrence when he is removed to a hospital and placed on a liberal diet, &c." "But," he goes on, "this is not so, as shown by cases that were kept in hospital for considerable periods and in which the disease, far from showing any improvement, advanced and the cutaneous lesions and gastro-intestinal disturbances were seen to recur at each succeeding season." One might accept this reasoning as perhaps conclusive if (1) the "liberal diet" is a biologically complete and adequate one, and, more important still, if (2) being "placed on" such a diet and actually

[1] Goldberger and Wheeler: U.S. Public Health Reports, Nov. 12th, 1915, and U.S. Hygienic Laboratory Bull., No. 120, February, 1920.

[2] THE LANCET, May 1st, 1920, p. 953.

[3] Journ. Trop. Med. and Hyg., Feb. 19th, 1920, p. 46.

consuming it could be assumed to be synonymous. That this assumption can be allowed only as a broad general proposition and that it may fail in individual instances has already been sufficiently indicated in connexion with the essentially identical assumption by Dr. Enright. In the light of the results of large-scale experiments designed to test the preventability of pellagra by means of an appropriate diet,[4] I may, perhaps, be permitted the suggestion that Dr. Viswalingam's unsatisfactory results may be accounted for on the ground either that this "liberal" diet was not really an adequate one, or, more probably, that the patients did not *eat* it. They may not have consumed this diet either because it was not given or because the patient refused some parts (poor nursing), or, finally, because he was dealing with complicated cases (evidences of dysentery, ankylostomiasis, malaria, and scurvy were present in at least 60 per cent. of his cases), or cases so far advanced that recovery was impossible. In this connexion it may be pointed out that the value and the significance of the results of the therapeutic test of diet is much inferior or, more properly, must be differently gauged from that of the preventive test. In evaluating the significance of the results of the former allowance must be made (exclusive of complications) for the varying degrees of severity and extent of the existing damage from the disease, so that recovery in the majority of (severe) cases is all that can, perhaps, be reasonably expected; in prevention, however, assuming proper control of the diet and of the pellagrin, practically complete eradication may with confidence be expected.

It follows from the foregoing that Dr. Viswalingam's hypothesis of a "superadded infection," like Dr. Bigland's "toxin hypothesis," has been invoked without substantial grounds, and like the latter must be regarded as superfluous.

I am, Sir, yours faithfully,

JAS. GOLDBERGER,
Surgeon, U.S. Public Health Service.

Washington, June 5th, 1920.

[4] Goldberger, Waring, and Willett: U.S. Public Health Reports, 1915, vol. xxx., p. 3117, and unpublished data.

CARRIAGE OF MALARIA BY HIBERNATING MOSQUITOES.

To the Editor of THE LANCET.

SIR,—I have been reading Colonel S. P. James's most interesting book on "Malaria at Home and Abroad," which has just been published, and I should like to correct an error which appears on p. 14. He says that in the Balkans I showed that 40 days were required for the malaria parasite to attain maturity in the mosquito at a temperature of 62° F. I conducted a number of experiments with mosquitoes and malaria, but in none did I find such a long period of development, except in cases where the latter was intentionally arrested by exposing the mosquitoes to hibernating conditions. Large numbers of mosquitoes were dissected from Lehanah village, where there was a high malaria rate amongst the children and where the prevalent mosquito was *Anopheles superpictus*. These dissections were carried on through the summer and winter of 1918–19, and an interesting result was that partially developed oöcysts were found in mosquitoes all through the winter. The oöcysts appeared to be normal, and the question arose as to whether it would be possible for such oöcysts to continue their arrested development when temperature conditions became more favourable.

In the Macedonian village the anopheles pass the winter most usually in the barns or cow-houses below the living-rooms of the natives. In these the temperature is considerably higher than in the empty barns, where mosquitoes are more rarely found. During the winter the mosquitoes are constantly feeding on the animals. Experiments were instituted, and it was found that in mosquitoes which had been fed on malaria cases and then incubated for a week the development of the oöcyst could be completely stopped by exposure to a temperature corresponding to the winter hibernation temperature of the mosquitoes. After three weeks' artificial hibernation the oöcysts continued their development when the mosquitoes were again incubated. It is thus quite possible, if not probable, that the oöcysts which I saw in the hibernating mosquitoes collected in the village, and which resembled in every way those seen in the experiment, would be capable of completing their development in the early part of the year when the temperature became sufficiently raised.

The experiments I carried out seem to prove that the malarial parasite can be carried over the winter by the hibernating mosquitoes. Exposure of infected mosquitoes with partially developed oöcysts to a low temperature in the ice-chest for 12 hours did not produce degeneration of the oöcysts, whereas a longer exposure did do so. It would seem that in nature a temporary exposure to a very low temperature on an exceptionally cold night would not prevent the subsequent development. I think it is possible that Colonel James has obtained the figure of 40 days from some of these hibernation experiments. I call attention to the carriage of malaria by hibernating mosquitoes because of its importance in antimalaria work, for it emphasises again the advisability of destroying the hibernating females during the winter. My experiments will be fully described in a paper which will be published later.

I am, Sir, yours faithfully,

Wellcome Bureau of Scientific Research, Endsleigh-gardens, Gordon-square, N.W., June 23rd, 1920. C. M. WENYON.

VARIOLA, VARICELLA, AND ALASTRIM.

To the Editor of THE LANCET.

SIR,—In the annotation in your issue of May 29th entitled Anomalous Cases of Small-pox, a list of characteristics is given which are said to differentiate the disease called "alastrim" from varicella on the one hand and from variola on the other. It is not stated where or when the observations which must underlie these formal distinctions were made, or on what authority the claim that they serve to differentiate alastrim from varicella and variola is based. To enter upon a detailed criticism of each feature in the list would take up too much space, but considering the supreme importance of the accurate differentiation of the small-pox rash from other rashes of similar type, it seems to me to be remarkable that the value in differentiation of observations of the distribution of the rash is not even suggested. Is it to be assumed from this omission that the distribution of the rash in alastrim cannot be distinguished from the distribution of the rash in varicella or in variola? Or is this factor in diagnosis considered to be of minor importance in comparison with those given in the list? In either case it is desirable that the omission should be rectified and that any observer who has had the advantage of opportunities of comparing alastrim with varicella on the one hand and with variola on the other should set down the results, whether positive or negative, of his observations. Dr. S. Monckton Copeman in the last sentence of his letter in your issue of June 5th says: "In both outbreaks the symptoms and general course of the disease more nearly resembled those of alastrim than of typical small-pox," but he makes no reference to the existence of a distribution sign as a factor in diagnosis, and although I had the advantage of hearing the interesting paper which he read before the Epidemiological Section of the Royal Society of Medicine, I failed to appreciate that he had observed any differences in the features of the distribution between the cases which he cited and the cases of true variola which were associated with his cases in the Norfolk and Suffolk epidemic.

If I seem to lay undue emphasis upon this factor in diagnosis my excuse is that in the London Receiving Station and in this hospital, following the teaching of my predecessor, the late Dr. T. F. Ricketts, we have always regarded the features of distribution as of paramount and really overwhelming importance in the examination of suspected rashes of focal type. It may therefore be understood that a list of tests in which this factor finds no place must fail to inspire confidence in anyone who has appreciated Ricketts's teaching or has personal know-

ledge of the results which are obtained by the use of his method of differentiating the focal rash of small-pox from other rashes of similar type. In fact, if the claim that the conditions as set out in the list serve to differentiate alastrim from variola and from varicella is sound, there is no doubt that among the 11,000 patients admitted to the London Small-pox Hospital during the last 20 years there were many cases of alastrim and of varicella indiscriminately mingled with the cases of true variola. Under such conditions it is remarkable that during this period second attacks or relapse of disease or the intercurrent appearance of a focal rash (accidents of this nature might appear under any of these headings in the hospital records) have never been recorded. Vaccination has been used and is now used in a small proportion of difficult cases as a crucial test in diagnosis, but since only a very small proportion of the cases sent into hospital were subjected to vaccination for this purpose at the receiving station, and since it is claimed that vaccination confers an immunity of only limited duration to alastrim, the complete absence of secondary rashes of the focal type seems to require explanation.

Unfortunately I have had only one opportunity of examining a case in which the diagnosis of alastrim was suggested, and in regard to it I can only say that all the important signs of small-pox were present when the case first came under my observation. In my experience the full development of these signs may in some cases of genuine small-pox require five or even six days, counting from the appearance of the first lesions. The outbreak of epidemic small-pox is so frequently accompanied by the appearance of diseases similar in type of eruption but yet differing in a nondescript sort of way from true variola. It was so in 1902 when Cambridge was attacked. Again, a few years later a discussion was raised concerning "amaas" and its relation to small-pox in South Africa. Now we have alastrim. But no one has offered to explain why these nondescript diseases have been in all these instances associated and not infrequently in series with cases of typical and therefore unmistakable variola. Small-pox is a protean disease. At the present time the practical work of differentiating the focal rash of small-pox from other similar conditions must depend on clinical observation. Until the time arrives when an advance in bacteriological method may enable us to recognise the existence of varying types of the organism, it would seem to be the safe course for us in this country to continue to assume that variola and varicella are distinct diseases which breed true and differ in their clinical characteristics, that vaccinia is a relative of variola, behaves as such, and under certain well-defined conditions is a crucial test for the presence of small-pox. We may thus avoid on the one side the fallacy of the new disease or of the new benign type which is so prone to revert to the original savage, and on the other the absurdity of the suggestion that varicella should be isolated.—I am, Sir, yours faithfully,

A. F. CAMERON,
Medical Superintendent, River Hospitals and Ambulance Service, Metropolitan Asylums Board.
Dartford, Kent, June 26th, 1920.

THE ASSESSMENT OF HAND INJURIES.

To the Editor of THE LANCET.

SIR,—I am much interested in Mr. J. J. Scanlan's article on this subject in your issue of June 26th. Speaking only from a year's experience as chairman of a Pensions Board, I consider his suggestion of a diagram of the pensioner's hand excellent. I am inclined to think that too much time is at present spent in the minute description of scars, frequently to the exclusion of more important facts. It is, however, surprising how easily glaring errors in description may arise during the stress of actual examination. The differentiation of the thumb causes difficulties in the description of the hand to be greater than those of the foot, although dorsiflexion at the ankle provides pitfalls. It is easy in dictating a description of a hand injury to subconsciously associate the first metacarpal with the first finger, and a momentary loss of concentration of attention, due, perhaps, to an adjacent board's struggles with a deaf pensioner, may even lead to the substitution of the word left for right, with disastrous results to the description.

The subject on which I should have liked a fuller expression of opinion is the proportional disability of the loss of the hand compared with amputations higher up the limb. Speaking again from my limited experience, amputation of a hand or complete loss of use is a very serious disability, and in my opinion a lesser assessment on the usual scale compared with amputations higher up is only justified if the man can be fitted with a useful appliance. A practical detail in the elucidation of the utility of the hand is that every pensioner should undress himself in the examiner's presence. Although when done as a routine it apparently leads to waste of valuable time, it is really of great importance, as he will often unconsciously demonstrate the presence of more usefulness in the hand than is apparent at the subsequent formal examination.

I have been disappointed hitherto with the types of artificial arms I have come across. It is true that some are marvels of ingenuity; the pensioner newly provided with such an arm will give himself a twist, the mechanism clicks, and he shows with evident pride how he can pick up a match from the table. But after a time the tendency seems to be to only wear the arm on State occasions. A much more useful contrivance seems to be that of a forearm piece into which the tools of a man's trade can be individually screwed.

But the point which I think has struck me most as regards disabilities in general in this age of specialisation is that so far as elderly men and adults are concerned it is of supreme importance to try to enable the pensioner to follow his pre-war occupation rather than to advise him to learn a new trade.

I am, Sir, yours faithfully,
FRANCIS HEATHERLEY, M.B., B.S., F.R.C.S.
Ashville, Audenshaw, Manchester, June 27th, 1920.

THE CLINICAL DIAGNOSIS OF DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—I see from your issues of June 5th and 12th that my statements *re* the above have not been allowed to pass unchallenged, nor is it desirable that they should, for the subject requires critical investigation in order, if possible, to arrive at the truth. I am grateful to you and to your correspondents for their criticisms, and will reply to the various points seriatim.

(1) In reply to Dr. A. K. Gordon, I do not for one moment suggest that ocular diagnosis should be used "as an alternative" to bacteriological investigation. As a matter of fact, a bacteriological examination has been made in every case of "diphtheria" under my care at the fever hospital. This ought to be done in every case of ulcerative or membranous sore-throat. I maintain, however, that naked-eye diagnosis, *if reliable*, is much more important than the bacteriological, and I have always given my diagnosis from the naked-eye appearance, and have only in a few cases prescribed any antitoxin in "diphtheria" cases that did not show what I considered were the characteristic appearances of the disease; and then only as a possible preventive. (*a*) I have not been impressed with the difficulty mentioned by Dr. Gordon under this paragraph. How does Dr. Gordon diagnose scarlet fever in the absence of the rash? If the typical rash and sore-throat are present where is the difficulty? (*b*) How does the naked-eye appearance differ as it affects (1) adults, (2) children? I have failed to observe any difference, and shall be interested to learn what has been observed elsewhere. In not a single case of "diphtheria" where I made the diagnosis of tonsillitis did I succeed in finding the Klebs-Löffler bacilli, even after 24 hours' incubation. Is not the diphtheria germ occasionally found in the throat not only of healthy nurses but also in healthy individuals outside hospital? (*c*) So far as I am aware, there have been only two cases of scarlet fever sent into hospital as "diphtheria." It is clear, therefore, that in

this area scarlet fever is not "*the* disease in which the differential diagnosis is most important"; at any rate, it is not the one in which mistakes have most frequently occurred; whereas in regard to follicular tonsillitis and influenza mistakes have been common. Neither is it my experience that the co-existence of scarlet fever and diphtheria is "commonly seen" as stated under (*a*). In a few cases of scarlet fever the throat looked "suspicious," and I prepared cultures; in each case the result was negative.

(2) "A Veteran" asks if my method of diagnosis is not "too good to be true." The answer to this is that for over three years it has been true.

(3) I am particularly obliged for the remarks in your leading article on p. 1276, and agree with many of them. You say there, "but cases are surely not uncommon in which a single patch is present in the tonsil." In tonsillitis, I think if practitioners will examine *the whole* of the tonsillar area with care they will find the single patch extremely uncommon. With many cases of diphtheria there is some tonsillitis, but this is quite distinct from "follicular tonsillitis," and in the latter disease I have never seen a single patch since I began to examine the throat critically, and I have on several occasions seen three or four patches after being informed by other observers that there was only one. I have heard several medical men say they "think" they have seen such or such an appearance. May I draw the attention of my medical brethren to the fact that my statements are based on graphic records, made at the bedside of the patient, so that there has been no need to "think" whether the patch was single or multiple.

I should like to ask Dr. Gordon to be good enough to state what he considers the characteristic appearance of diphtheria (of the fauces); or if he always has to wait for the report of the bacteriologist. Is the report of the bacteriologist always reliable? I think not. Only a short time ago I sent a specimen to one of the leading professional bacteriologists in the kingdom and was informed that diphtheria bacilli were present; then, a few days later, I received another note stating that the bacilli present were not the true Klebs-Löffler bacilli, though indistinguishable from them as seen under the microscope. It is also well known that a negative result is not infrequently obtained on first examination, and afterwards a positive one in the same patient—i.e., at first the bacteriological diagnosis is *wrong*, and if followed as a guide to treatment would be likely to lead to the disastrous results which Dr. Gordon refers to as likely to arise from depending on the eye alone. I may add that the published drawings illustrative of my paper in THE LANCET are only a small selection of about 200; all the rest, however, illustrate the same points and might equally well have been chosen. In conclusion, allow me to express the hope that this discussion will ultimately lead to a more satisfactory diagnosis of infectious diseases of the fauces. The description that I have given relates to what has been seen at the Wrexham Fever Hospital and in my own private and consulting practice; it is for others to state what is seen elsewhere.

I am, Sir, yours faithfully,

Wrexham, June 19th, 1920. H. DRINKWATER.

THE EPIDEMIOLOGY OF PHTHISIS.

To the Editor of THE LANCET.

SIR,—In the introduction to Dr. John Brownlee's recent research publication on the Epidemiology of Phthisis, the Medical Research Council say that the division of the disease into types is "a challenge to the bacteriologist and clinician alike to coöperate in closer analysis of the different infections and of the responses to them made by the body at various ages and in particular environments." "These two (or perhaps three) types either correspond with separate types of infecting bacillus, as Dr. Brownlee inclines to believe, or they mark different types of physiological response made by the human body to the infection at different ages," and I would add to the latter, "with definite racial or family characteristics."

I would like to present the case from another aspect, as a clinician, but in no way desire to differ from the most astute and painstaking observations by which Dr. Brownlee has shown us that phthisis must be definitely divided into types.

As a clinician I have unreservedly accepted Dr. Brownlee's young adults (Y.A.) and middle-age (M.A.) types. After reading Dr. Brownlee's first paper I divided into groups 31 deaths from the insured patients whose duration of illness was accurately known and was specially investigated for this purpose. These groups were three: The first, those dying within one year of first symptom; second group, those in whom known symptoms had existed over two years; and third, the intermediate and indeterminate group dying between one and two years from the onset of disease. None of the 14 constituting the first group dying within the year were found to be between the ages of 22 and 43, 7 (or half) were between 17 and 22 years of age, and the remaining 7 were all over the age of 43 and would presumably come in Dr. Brownlee's old-age (O.A.) group. There were 9 cases in the chronic class with symptoms of over two years' duration; 8 of these died between the ages of 22 and 43, and would constitute Dr. Brownlee's middle-age (M.A.) type. The intermediate group of those dying between one and two years after the first onset of symptoms, 9 cases in all, were of all ages from 17 to 55.

Clinically the three types apparently exist, and they coördinate with the duration of the illness. Y.A. and O.A. are acute and M.A. is chronic, and the other deduction seems also correct, that the middle-aged type (M.A.) is subject to environmental conditions and is eminently curable. Y.A. and O.A. types are far more difficult propositions, but in all families believed to be subject to Y.A. type, susceptible persons were given prophylactic doses of tuberculin (P.T.O.), which so far has proved efficient in preventing any subsequent cases developing among them. This accords with Dr. Brownlee's observations that early milk infection protects from Y.A. type. These cases are too few to found any positive deductions on, but are very suggestive that, clinically, coördination exists between the age and the type of the disease, as suggested by Dr. Brownlee's paper.

Coming now to the cause of the type, I started out with the idea it was strainal, or caused by a special variety of tubercle bacillus, but have now come to the opinion it is a physiological age response accentuated by certain family or racial characteristics. The response of the human tissues to the tubercle bacillus is an age response all through, both in its active and in its immune periods, but acts quite differently in men and women. In early years the danger to woman is very great, but in her case it steadily diminishes with her increasing resistance as age progresses till, in Australia at any rate, it is almost non-existent among women between the ages of 45 to 50. In the male the danger to those attacked between 15 and 25 is not so great, but reaches its highest point between 45 and 50. Physiologically men and women are under very different conditions. A woman usually reaches her maximum strain before 30 and then steadily diminishes, but a man's maximum strain is not reached till after 40.

In regard to the proposition advanced, "How far has the elimination of the susceptible made for the improved urban conditions?" there are fewer susceptible families, I think, than is generally supposed. In 125,000 people investigated there were only five proved susceptible families, and I think this elimination of susceptibles in towns is due to greater marriage intermixture, raising the resistance to a higher level.

Considering possible causes of the decline of phthisis in recent years, I would add a sixth cause to Dr. Brownlee's five—namely, the increase of resistance resulting from intermarriage, as well as from the improved hygienic conditions that the intermixture of races has promoted. This cause affects the Y.A. type especially. Should this view prove correct, the position would be that Y.A. phthisis, being principally a racial and family disability, would be advantageously affected by movement of population. Whereas M.A. phthisis, being a hygienic and physical strain disease, would be principally affected by hygienic conditions of work and feeding. The industrial migration in Lancashire would thus account for the fall of Y.A. phthisis death-rate, which has occurred without affecting M.A. phthisis.

No consideration of causes of modern variation can be complete without taking into account the alteration in the type of foods used in large towns. The whole-foods of our ancestors, with their complete vitamines, have been largely replaced to-day by the manufactured foods, with their absence of vitamine. The food factor to-day is one of increasing importance, and there seems no doubt that both butter-fats and good fresh meats have certain unknown resistance-raising qualities which are not found in modern margarine and in the tinned and frozen meats so largely used by the working population.

To my mind Dr. Brownlee gives away his own case for strainal differentiation as against physiological and racial differentiation in the production of types of tubercle when, in the paragraph discussing the incidence of phthisis in Wales (p. 64), he writes :—

"In the district of Pembroke itself, that is the district South of Milford Haven, there is little phthisis. This absence of tuberculosis occurs in spite of the fact that the cattle of South Pembroke are largely Short Horn, *a breed which is very subject to tuberculosis*, while the cattle North of the Prescilly Mountains are of the long-horned black Welsh breed, which is seldom affected with that disease."

Surely if the breed in cattle varies the incidence without presupposing a special strain of bacillus the same should hold good in man. But however this may be, and however we may differ as regards the interpretation of the facts, the fact remains that Dr. Brownlee has conclusively shown that in future phthisis must be divided into three types for investigations if we are to attain to any results, and that his description of the types and their associated relations are clinically correct. Clinically the middle-age type (M.A.) is essentially environmental and certainly can be dealt with, given control of that environment. The question is one of individual resistance and is thus an eminently treatable proposition. At present we have not sufficient evidence to show that this is the case with the Y.A. type, which I regard as largely a question of family and race which will tend to die out with racial intermixture. As far as the British races are concerned the racial strains liable to Y.A. tubercle must be mainly those of Celtic origin, with whose temperamental proclivities we must all be acquainted. We must remember that early tubercle is essentially a nervous disease, or rather that a nervous condition manifestly tends to the loss of resistance which is so serious a factor in those thus threatened.

In considering the geological epidemiology, a necessary factor, clinically a cardinal factor, is the occurrence of lime in the drinking-water. I believe there are considerable grounds for stating that other things being equal people bred and resident in lime districts or those whose drinking-water is impregnated with lime are more resistant clinically to tuberculosis, and this is natural, as lime is Nature's method of combating the disease. I have recently had a remarkable confirmation of this view from Dr. E. A. Wilson, of Keighley, who writes :—

"Half my district is on clay, the other on agricultural limestone. Excluding urban areas, I see large numbers on the clay area and very few in the limestone area. In fact, in the limestone area, a branch dispensary had to be closed from lack of patients, and the few patients in that district do far better than in the clay area."

If these remarks promote discussion from the clinical side of the type problem of tuberculosis their object will have been attained. May I say, in conclusion, that every tuberculosis officer should read Dr. Brownlee's Part III., as it will be found an essential starting-point for all future thought on the subject.

References.—1. An Investigation into Epidemiology of Phthisis in Great Britain and Ireland, Part III., Medical Research, by John Brownlee, M.D., Director of Statistics, Medical Research Committee, H.M. Stationery Office, Kingsway, &c. 2. Report of Parliamentary Committee on Tuberculosis; Death and Invalidity in the Common wealth, December, 1916.

I am, Sir, yours faithfully,

HENRY A. ELLIS,

June 14th, 1920. Ex-Tuberculosis Officer, Middlesbrough.

CONGENITAL STENOSIS OF THE AORTA.

To the Editor of THE LANCET.

SIR,—We have been interested in Dr. R. O. Moon's case of congenital stenosis of the aorta described in THE LANCET of June 19th. A case resembling it in some respects was recently under our observation, and the variations in the electrocardiograms taken from it make it also worth recording.

The patient was a boy of 10 years, stunted in growth, and complaining of general debility. His mother reported that he showed "blueness of the face when bathing" and that he had not suffered any special illness. His apex beat was in the fifth interspace and was not particularly forcible. A pronounced systolic thrill was palpable over the aortic area. Cardiac dullness was slightly greater than normal at the base and normal at the apex. A systolic murmur was audible at the aortic, pulmonary, and mitral areas, having its point of maximum intensity in the second right intercostal space, and its only direction of conduction upwards towards the carotid. Radial tracing showed pulsus tardus. The physical signs and symptoms strongly suggested congenital stenosis of the aorta.

An electrocardiogram taken on Feb. 10th, 1920, showed the T-wave to be inverted in Leads II. and III., the P-wave was inverted in Lead III., and there was preponderance of the left ventricle. A second electrocardiogram taken on March 5th showed that the T-wave in Lead II. was no longer inverted, the line between R and P remaining practically straight. A third electrocardiogram was taken on April 9th, and showed the T-wave in Lead II. to be of normal outline. The other features of this electrocardiogram were unaltered and remained as in the first one. The patient was not under the influence of digitalis at the time these electrocardiograms were taken.

If inversion of the T-wave in Lead II. is invariably a sign of degeneration of cardiac muscle and therefore of grave prognostic import, as it is held usually to be, then the return of such T-wave to its normal outline ought not to be expected in the course of a few weeks. In this relation the post-mortem finding of normal heart muscle in Dr. Moon's case is very significant. Is it more than a coincidence that these two cases, which exhibit inverted T-waves in Lead II. are cases of congenital aortic stenosis and may such a cardiographic feature be considered characteristic of this form of congenital heart disease? We have not observed it in any other type of congenital heart disease, but we should like to learn the experiences of others in this respect.

We are, Sir, yours faithfully,

MURRAY BLIGH,
Honorary Physician, Northern Hospital, Liverpool.
I. HARRIS,
Honorary Physician Cardiographic Department,
June 26th, 1920. Northern Hospital, Liverpool.

RACE PATHOLOGY.

To the Editor of THE LANCET.

SIR,—Dr. G. Rome Hall's contribution to race pathology, which appears in your issue of June 5th, is of practical importance. Until recently, when Jewish learned societies took steps to collect statistical facts concerning the Jewish race, most of the references and statistics on comparative racial pathology were obtained from foreign sources, as the sickness and mortality returns of the Registrar-General made no reference to religious or racial factors. Although Dr. Hall has only been able to deal with the Russian type of Jew from the age of 18 to 42, nevertheless his article should lead to much valuable discussion and further study on a subject which is both fascinating and of practical utility.

No doubt it was impossible for Dr. Hall, in the amount of space at his disposal, to go more fully into his subject. Had he been able to do so, his fuller views would have been welcomed on certain defects and diseases which medical literature has shown to be very rare or very common among Jews. The reference is to such conditions as alcoholism, diabetes, gout, myopia, and glaucoma, nerve diseases, surgical tuberculosis, and diseases of the rectum, among other things.

Experience in medical practice, correlated with the experience of others, as gathered from existing literature by those who have had opportunities of studying Jewish morbidity, agrees in many respects with Dr. Hall's conclusions on the racial incidence of disease among Jews. Lack of space prevents entering into many of the causes, apart from what Dr. Hall has already mentioned, that would probably explain the morbid conditions he has outlined in his useful article. There will be dissent, however, from Dr. Hall in certain of his findings. True epilepsy we seldom encounter among Jewish patients, and both Charcot and Worms, from their experiences among hospital patients, point to the rarity of epilepsy in Jews as compared with non-Jews. This rarity may be attributed to the absence of the predisposing factors of syphilis and alcoholism in Jewish parents. The diet of the Russian Jew is excessive in starch, because of the habit cultivated from their Slav neighbours of eating an excessive amount of bread, but Dr. Hall's remarks that the Russian Jewish dietary is deficient in proteins and contained fats which were vitamine-free will be challenged. Reports of investigators in vitamines—e.g., Mellanby,[1] and personal experience in Jewish dietaries, disagree with Dr. Hall's observations.

[1] THE LANCET, April 17th, 1920.

Though it must be confessed that venereal disease is on the increase among Jews, yet statistics everywhere point to the fact that organic nervous diseases and the dermatoses secondary to syphilis are much less frequent in the Jewish race than among the general population. It might also be mentioned that circumcision in the Jew does away with the evils that result from phimosis and paraphimosis, lessening also the likelihood to infection by syphilis (Breitenstein's statistics prove that syphilis is five times as frequent in the uncircumcised—the immunity is said to result from the toughening of the exposed glans), and accounts for the fact that not a single case of carcinoma of the penis in a Jew has yet been recorded.

I am, Sir, yours faithfully,

SAMUEL SAMUEL, M.D., M.R.C.S.,
Late Captain, R.A.M.C., Honorary Medical Staff, Leeds Jewish Hospital.

June 12th, 1920.

ANGLO-AMERICAN LIBRARY FOR CENTRAL EUROPE.

To the Editor of THE LANCET.

SIR,—Would not the above undertaking, noticed by you a while back, be now more useful if it functioned merely as an exchange of scientific and other literature between the countries concerned? The immediate reason is the unsatisfactory working of existing agencies. In my own case H.M. Stationery Office is now very irregular in its deliveries, while a leading book importer has for months not been able to fulfil an order for the whole war-time issue of a Vienna medical magazine, in spite of the offer of a fair price for the same instead of the exchange rate. The remote reasons are the (mostly silent) change in informed persons' opinions as to the origin and conduct of the war, the result of the partial removal of the censorship—a change expressed by Mr. Chesterton in the epigram that all that thought itself on a pedestal now finds itself up a tree—and the even greater alteration in British opinion concerning Freud's work; it is not so long since some medical journals here—not, I think, THE LANCET—allowed the late Dr. Mercier to write in their columns of psychoanalysis as fraud and pornography.

I am, Sir, yours faithfully,

June 26th, 1920. CADUCEUS.

DR. JOHNSON AND SECOND SIGHT.

To the Editor of THE LANCET.

SIR,—In the *Cornhill Magazine* for the current month Mr. Edward Clodd discourses in his usual pleasant fashion upon the subject of Dr. Johnson and the phenomenon generally known as "second sight," though it ought to be called, as Mr. Clodd points out, "two sights"—i.e., the one of the world of sense and the other of the world of spirit. Belief in this double sight is as old as human history, and in my opinion cannot in any general way be ascribed to diseased mentality. Even the wisest of us understand but little of the workings of the mind, and the belief that there is a spiritual world to appreciate which the eye may be sometimes opened is nearly universal, and not at all confined to any over-imaginative or readily credulous section of the people. "Second sight" in common parlance means the power possessed by some persons of foretelling the approaching death of others by seeing them shrouded to a greater or less extent, according as their death is imminent or the reverse. Mr. Clodd says "One of the earliest references in this matter is given in the 'Polychronicon' of Ranulf Higden." I presume that he means one of the earliest as regards the belief in the Scottish Isles, for, of course, the earliest and far best known instance on record is the vision of Theoclymenus in the Odyssey, Bk. XX., of the approaching death of the suitors. Other portents of death seen by the second sighted and quoted by Mr. Clodd include visions of black dogs, funerals, and corpse candles. These matters Andrew Lang explained by assuming that such manifestations are merely a kind of aphasia from which spirits suffer owing to their not possessing any matter through which they can make their wishes or ideas manifest. For instance, in the story entitled "In Castle Perilous," Lang makes a communicative spectre explain that the Puddifant ghost "has been trying for generations to inform his descendants that the drainage of the castle is execrable. Yet he never can come nearer what he means than taking the form of a shadowy hearse-and-four and driving round and round Castle Puddifant at midnight."

To return to Dr. Johnson, he was willing to believe in second sight, but does not seem to have found altogether convincing evidence, although he told Boswell in a discussion on the matter that instances of fulfilment of such omens "have happened so often that mankind have agreed to think them not fortuitous." As with so many other matters, the worst that can be said against second sight in the restricted meaning of premonition of death is, we think, "not proven," while if there were no belief in supersensual things, music, poetry, and painting would scarcely exist. Handel and Blake with their "multitude of angels," Ruskin and Newman with their vision of natural phenomena as the fringes of God's garment, Traherne with his poems on childhood, are all examples of this; while in other literature, to take only one example, there is the intensely dramatic scene in the Second Book of Kings when the King of Syria sent an army to arrest Elisha and "the Lord opened the eyes of the young man; and he saw, and behold, the mountain was full of horses and chariots of fire round about Elisha."—I am, Sir, yours faithfully,

June 22nd, 1920. M.D.

THE STANDARDISATION OF COLOUR PERCEPTIONS.—This correspondence is closed. A further letter, received by us from Mr. J. H. Parsons, has not been inserted as Mr. Parsons has already announced his intention of dealing with Dr. Edridge-Green's position elsewhere in detail.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At examinations for medical and surgical degree held in Easter term the following candidates were successful:—

THIRD EXAMINATION.

Part I., Surgery and Midwifery.—L. W. Batten, Sidney Sussex; W. L. Berry, Caius; P. F. Bishop, Clare; H. J. Bower and J. H. Burn, Emmanuel; W. F. Castle, Trinity; P. D. H. Chapman, Sidney Sussex; V. M. Coates and H. E. Creswell, Caius; H. T. Cubbon, St. John's; L. Cunningham, Downing; W. D. Doherty, King's; C. C. R. Downing, Pembroke; N. D. Dunscombe, Downing; J. Fairbrother, Caius; V. N. Fenton, Queen's; D. G. Garnett, Pembroke; C. I. C. Gill, King's; A. C. V. Gosset, C. Grantham-Hill, and E. A. H. Grylls, Caius; G. Habgood, Clare; A. C. Halliwell, Caius; F. R. G. Heif, Sidney Sussex; J. M. Higginton, St. John's; H. W. Leatham, Trinity; A. A. Lees, Emmanuel; E. E. Llewellyn, Christ's; F. S. Maclean, Jesus; E. C. Malden and L. B. Maxwell, Caius; J. W. McK. Nicholl, Queen's; C. C. Okell, St. John's; C. L. Pasricha, Caius; R. Y. Paton, Trinity; K. Playfair, Caius; H. J. A. Pollard, Clare; J. L. Potts, Caius; W. Raffle, St. John's; W. F. Rhodes, H. Selwyn; H. A. Richards, Clare; P. Richardson, Christ's; A. P. Saint, Downing; F. N. Sidebotham, Clare; F. V. Squires and H. N. Stafford, Caius; S. D. Sturton, Emmanuel; M. B. R. Swann, Caius; W. S. Sykes, Emmanuel; K. H. Tallerman, Caius; W. S. R. Thomas, Queen's; G. S. Trower, King's; W. G. Verniquet, Emmanuel; G. H. Ward and G. C. Wells-Cole, Caius; R. C. P. Whitcombe, King's; and J. M. McC. Wright, Pembroke.

Part II., Medicine, Pathology, and Pharmacology.—W. E. H. Banks, Clare; H. Barbash, St. John's; L. W. Batten, Sidney Sussex; W. L. Berry, Caius; J. H. Burn, Emmanuel; W. F. Castle, Trinity; M. T. Clegg, Jesus; C. B. Cohen, Trinity; C. C. R. Downing, Pembroke; H. S. Evans, Trinity; L. P. Garrod, King's; W. N. Goldschmidt, Pembroke; E. F. S. Gordon, St. John's; A. C. Halliwell, Caius; F. R. G. Heif, Sidney Sussex; E. P. Hicks, Trinity; J. M. Higginton, St. John's; R. Hilton, Corpus Christi; R. Lester Williams, St. John's; P. T. Liang, Caius; R. K. Merson, Emmanuel; F. Moor, Trinity; C. C. Okell, St. John's; F. P. N. Parsons, Pembroke; R. A. W. Procter, Clare; W. F. Rhodes, H. Selwyn; M. K. Robertson, Trinity; C. J. Scholtz, Emmanuel; C. G. Schurr and R. S. Scott, Caius; W. J. D. Smyth, Pembroke; F. G. Spear, Christ's; C. Suffern, Emmanuel; M. B. R. Swann, Caius; W. S. R. Thomas, Queen's, G. S. Trower, King's; E. W. Todd, Trinity; E. B. Verney, Downing; W. G. Verniquet, Emmanuel; T. T. B. Watson, Christ's; J. M. McC. Wright, Pembroke; and H. B. Yates, Downing.

UNIVERSITY OF OXFORD.—At examinations held recently the following candidates were successful:—

SECOND EXAMINATION FOR DEGREE OF BACHELOR OF MEDICINE.

Materia Medica and Pharmacology.—C. W. C. Bain, Christ Church; J. L. Cox, Brasenose; R. S. Creed, Trinity; D. G. T. K.

Cross, St. John's; D. G. Davies, Magdalen; C. F. T. East, New; S. Hartley and H. C. Hill, Hertford; B. W. Williams, Exeter; and W. A. Young, Jesus.

Pathology.—D. G. T. K. Cross, St. John's; I. Harris, Jesus; S. Hartley, Hertford; T. S. Nelson, University; and W. F. Skaife, Trinity.

Forensic Medicine and Public Health.—C. K. J. Hamilton, Lincoln; W. E. Hayes, New; J. T. S. Hoey, Jesus; J. G. Johnstone, St. John's; E. G. M. T. Liddell, Trinity; T. S. Nelson, University; H. L. Rayner, Balliol; G. H. Rossdale, Merton; W. F. Skaife, Trinity; and W. S. Tunbridge, Lincoln.

Medicine, Surgery, and Midwifery.—H. E. A. Boldero, Trinity; H. G. Burford, Christ Church; and T. S. Nelson, University.

MASTER OF SURGERY.

W. H. Ogilvie, New; and N. A. Sprott, Christ Church.

DIPLOMA IN PUBLIC HEALTH.

Part I.—T. C. Backhouse, M. S. Baker, A. R. Balmain, L. W. Barlow, F. E. Bendix, C. K. Carroll, R. J. W. A. Cushing, S. C. Davidson, F. W. Kemp, C. Kingstone, T. J. Lloyd, H. R. Macintyre, J. S. Moore, M. Radford, W. C. Sawers, C. W. Sharpley, D. C. Suttie, and A. E. Woods.

Part II.—J. N. L. Blamey, A. R. Balmain, F. W. Hamilton, H. R. Macintyre, L. J. J. Orpen, W. C. Sawers, D. C. Suttie, C. H. Warner, and E. A. Woods.

UNIVERSITY OF MANCHESTER.—The following recommendations have been approved for the degree of Doctor of Medicine (by dissertation):

J. G. Bennett, R. B. Berry, Mary G. Cardwell, J. W. Crawshaw, Jacob Holker (Gold Medal), R. C. Hutchinson, E. A. Linnel, (commended), A. H. Macklin (commended), R. A. Needham and F. C. Ormerod (commended).

UNIVERSITY OF GLASGOW: COMMEMORATION DAY DEGREES.—On Thursday in last week the degree of Doctor of Laws was conferred by the University upon, among others, Dr. John Macintyre, Glasgow; Sir Robert W. Philip, Edinburgh; and Lieutenant-General Sir David Henderson, Director-General, League of Red Cross Societies.

ROYAL COLLEGE OF SURGEONS OF ENGLAND: A ROYAL FELLOW.—The Duke of Connaught, accompanied by Sir Malcolm Murray and Sir Edward Worthington, paid a visit to the Royal College of Surgeons on June 24th to receive the diploma of Honorary Fellow. His Royal Highness was received by the President (Sir George Makins), the Vice-Presidents (Sir Anthony A. Bowlby and Sir John Bland-Sutton), and the Secretary (Mr. S. Forrest Cowell) and conducted to the Council Room, where the members of Council were assembled, together with Sir John Goodwin, Director-General of Army Medical Services, and Lieutenant-General Sir George Macdonogh, Adjutant-General to the Forces. The President, in presenting the diploma, referred to the association of His Royal Highness with the medical profession as Colonel-in-Chief of the Royal Army Medical Corps, and mentioned that King Edward, when Prince of Wales, was the first to become an honorary Fellow of the College and that King George had also become an honorary Fellow when Prince of Wales. His Royal Highness expressed his pleasure at becoming an honorary Fellow and signed the roll. A visit was afterwards paid to the Museum, where the President and Professor Keith showed some of the specimens from the War Office collection of pathological specimens and other objects of interest.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—The following candidates have passed the Final Dental Examination and have been granted the diploma of L.D.S., R.C.S. Edin.:—

Margaret Peterkin, Alexander Glen Thom, Ernest Purves Thomson, Thomas Archibald Hall, Johannes Vlok Basson, John Lawson Gibson, and Willem Frederik Pauw.

CENTRAL MIDWIVES BOARD.—A meeting of the Central Midwives Board was held at Queen Anne's Gate Buildings, Westminster, on June 23rd, with Sir Francis H. Champneys in the chair, when a letter was considered from the Carlisle District Nursing Association urging the desirability of holders of the C.M.B. certificate being required to practise midwifery for a period after their training. The Board decided to inform the Association that it appreciates the difficulties which arise from the fact that many midwives do not practise as such, and that it will take all opportunities which present themselves of improving the condition of things in this respect.—A letter was considered from the Ministry of Health enclosing a revised scale of fees which the Ministry proposes to prescribe for payments by local supervising authorities to doctors called in by midwives under Section 14 of the Midwives Act, 1918, and suggested alterations in Rule E. 20 to 23 bringing them more into conformity with Section 14 of the Midwives Act, 1918.—The question of a representation to the Ministry of Health with regard to the expediency of modifying the constitution of the Board was considered; the Board directed that a representation be made to the Minister of Health under Section 1 (1) of the Midwives Act, 1918, that it is expedient to modify the constitution of the Board.

LITERARY INTELLIGENCE.—Messrs. W. B. Saunders Company, Ltd., of London and Philadelphia, have just issued a new and well-printed list of publications amounting to 84 pages, with an index of authors and subjects and a résumé of new books on the back cover. The prices in the book are quoted in dollars, but an inset list is attached giving the prices in English money. A significant note is appended that "owing to the instability of conditions governing book manufacture the prices quoted are subject to change without notice."

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The annual general meeting of this society will be held at the West London Hospital on Friday, July 9th, at 5 P.M., with Dr. Herbert Chambers, the President, in the chair. The annual report of the council will be presented, also financial statements from the treasurer and editorial secretary, and officers for 1920–21 will be elected. Members who have not already paid their subscriptions are requested to send them without delay to the acting honorary treasurer, Dr. Arthur Saunders, 37, Harley-street, London, W. 1.

SOCIETY FOR THE STUDY OF INEBRIETY.—A meeting of this society will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on July 13th, at 4 P.M., when Mr. Arthur Evans will open a discussion on "Alcohol and Alcoholism in Relation to Venereal Disease." Members and Associates may introduce visitors. Subscriptions for the session 1920–21 should be forwarded as soon as possible to the honorary treasurer, Mr. Arthur Evans, 28, Devonshire-place, London, W. 1.

MEDICO-LEGAL SOCIETY.—The annual general meeting of this society will be held at 11, Chandos-street, London, W., on July 6th, at 8.30 P.M., when the officers for the ensuing year will be elected, and the report of the honorary secretaries, Mr. Ernest Goddard and Dr. Bernard H. Spilsbury, as well as that of the honorary treasurer, Mr. Walter Schroder, will be presented. At the conclusion of the meeting Dr. Josiah Oldfield will read a paper entitled, The Suicide Idea and Capital Punishment.

RESEARCH DEFENCE SOCIETY.—The annual general meeting of this society was held on June 3rd at 11, Chandos-street, London, W., when an address on Vitamines in their Relation to Health was given by Colonel R. J. McCarrison. The report of the committee states that several addresses, lantern lectures, and public debates have been arranged during the year, and that new editions of many pamphlets and leaflets have been required; a series of articles by members of the society has appeared in the *Daily Mail*. Dr. Andrew Balfour, Dr. Thomas Lewis, Professor W. M. Bayliss, and Dr. A. Drury have joined the committee of the society. The report of the honorary treasurer shows a satisfactory financial position, but in view of increasing expenditure and the desirability of extended activities, more members are needed.

SOCIÉTÉ DE THÉRAPEUTIQUE DE PARIS.—At a meeting of this society on May 12th Dr. R. Huerre read a paper on Ipecacuanhic Acid in Ipecacuanha and Deëmetised Ipecacuanha. His conclusions were as follows: (1) The total amount of ipecacuanhic acid contained in ipecacuanha powder was found in the officinal preparations of ipecacuanha; (2) the de-alkaloidisation of ipecacuanha in order to obtain a deëmetised preparation of ipecacuanha produced a quantitative and qualitative change in ipecacuanhic acid; preparations of deëmetised ipecacuanha contained ammoniacal salts. In a paper on the Treatment of Post-influenza Insomnia by Passiflora, Dr. H. Leclerc maintained that ordinary hypnotics, such as preparations of opium, chloral, and veronal, should be avoided, and should be replaced by antispasmodics, especially the passion-flower (*Passiflora incarnata* and *Passiflora cærulea*). The preparations of passion-flower most frequently used were the fluid extract and the tincture. Dr. Leclerc preferred the tincture, which he ordered in doses of 30–50 drops at bedtime.

ARTIFICIAL EYES FOR EX-SERVICE MEN.—Local War Pensions Committees will supply to ex-Service men who have suffered the loss of an eye on war service with artificial eyes, and the arrangements made by the Optical Appliances Depôt, Clifford's Inn, London, E.C. 4, are such that no delay ought to be experienced. Applications should in the first instance be made to the Local War Pensions Committee. The depôt possesses an immense stock of artificial eyes, and an elaborate matching system enables requirements to be met at short notice. A special staff is engaged upon the different processes of alteration, re-polishing, and re-cutting, every conceivable colour and shape being classified and made available. In most cases the necessary directions have to be given by local surgeons or hospital authorities, to whom a selection of eyes is despatched from the depôt, but in exceptional cases arrangements are made for the man to visit the depôt.

THE King has granted permission to Mr. Lancelot Edward Barrington-Ward, F.R.C.S. Eng. & Edin., to wear the Insignia of the Fourth Class of the Order of St. Sava, conferred upon him by His Majesty the King of the Serbs, Croats, and Slovenes in recognition of the services which he rendered to the Serbian sick and wounded under the auspices of the Serbian Relief Fund during the late war.

OXFORD OPHTHALMOLOGICAL CONGRESS: ELEVENTH ANNUAL MEETING.—This congress will meet on July 15th and 16th. The proceedings of the meeting will take place in the Department of Human Anatomy in the University Museum, kindly lent for the purpose by Professor Arthur Thomson, and will consist of addresses, demonstrations, a scientific and a commercial museum. The Doyne Memorial lecturer for the year is Mr. F. R. Cross (Bristol), who will lecture on The Nerve Paths and Centres concerned with Sight. The congress will be opened by the Master, Mr. Sydney Stephenson, on July 15th, at 9.45 A.M. Mr. A. S. Percival (Newcastle-on-Tyne) will speak on Light Sense, with some practical deductions drawn from its consideration, and Dr. Van der Hœve (Leyden) on Eye Symptoms in Tuberose Sclerosis of the Brain. A discussion on Perimetric Methods will be opened by Dr. Luther C. Peter (Philadelphia), who will limit his remarks to the new methods of perimetry and the types of cases for which they are especially adapted. The following will take part in the discussion, which will be continued after luncheon: Dr. Van der Hœve, Mr. W. W. Sinclair, Dr. Marx, Dr. S. Holth (Christiania) Mr. E. H. E. Stack, Lieutenant-Colonel R. H. Elliot, Dr. A. Maitland Ramsay, Mr. N. C. Ridley, Lieutenant-Colonel H. Herbert, Dr. W. Hardin Sears (U.S.A.), and Mr. Percival J. Hay. On July 16th, at 10 A.M., Mr. Maurice Barton will read a paper on an Examination of the Eyes of Pit Ponies, particularly with Reference to Miners' Nystagmus, followed by Mr. A. Hugh Thompson, who will speak on Physiological and Glaucoma Cups, and Mr. Rayner D. Batten on Premonitory Symptoms of Glaucoma. The Doyne Memorial Lecture will then be delivered by Mr. Cross, after which Dr. Louis Sambon will speak on Ancient Eye Instruments. At 2.30 P.M. at the Eye Hospital demonstrations will be given by Lieutenant-Colonel H. Herbert, Dr. Holth, Mr. Ridley, Mr. Batten, Mr. Percival, and Lieutenant-Colonel Elliot. The scientific and commercial museums will be open in the Department of Human Anatomy from 9.30 A.M. to 5 P.M. on the 15th, and from 9.30 A.M. to 1.30 P.M. on the 16th. Members who purpose to be present are requested to send the attendance fee (1 guinea) to the honorary secretary, Mr. A. Bernard Cridland, at Salisbury House, Wolverhampton, at their earliest convenience, and at the same time to intimate whether they desire rooms reserved in Keble College, and whether they intend to be present at the annual dinner.

ROYAL VICTORIA HOSPITAL, BELFAST.—Some figures published in the Belfast papers of June 21st are indeed serious to contemplate in respect to the Royal Victoria Hospital, Belfast. At the end of last year there was a deficit of over £5000. Five months of the current year are gone and, up to May 31st last, the total expenditure rose to £24,406. The receipts for the period were £15,956, leaving a deficit of £8450. If to this their initial £5000 indebtedness was added, the hospital finances were on the wrong side by over £13,000. Three wards opened up just before the war to overtake the increased demands for admission, were costing approximately £12,000 per annum. In 1914, the maintenance of the hospital cost £17,500, while it was estimated that for the current year £55,000 would be required. The hospital was costing more money than ever for its upkeep, and new departments—whose maintenance was an increased charge—had been initiated as the direct result of the war, and, as the treasurer put it, the financial position of the hospital was, comparatively speaking, worse to-day that at any time during its long history. The middle classes, who so loyally supported the institution in the past, cannot now, with their enormously increased financial burdens, do so, and unless the employers and workers subscribed more liberally the hospital will have to be curtailed in its work. The working classes by their subscriptions last year paid for the upkeep of only 96 beds (i.e., £12,500), and the employers by their contributions supported simply 65 beds. The hospital is a magnificent insurance for both employers and employed, and both—who have financially made so much of late in Belfast—will have to contribute far more. For over half a century those of the working classes who have contributed a penny weekly (say 4*s*. 4*d*. a year) to the Royal Victoria Hospital, Belfast, have received in exchange the very best medical, surgical, and specialised advice in both extern and intern departments (except in the case of tuberculosis and zymotic and mental disease), and yet they have not individually increased their rate of subscriptions. In the serious circumstances the honorary treasurer appeals to both the working classes and the firms in Belfast to double their contributions.

DEATH OF MRS. MERCIER CLEMENTS.—The medical profession in the north of Ireland has suffered a personal loss in the death from encephalitis lethargica, on June 24th, of Mrs. Mercier Clements, wife of Dr. R. G. Mercier Clements, recently returned as a member of the Belfast City Council. Mrs. Mercier Clements was a well-known figure in public philanthropic work. An admirable speaker, she was closely identified with temperance work and maternity and rescue organisations. During the war she acted as honorary secretary of the unemployment scheme in Ulster.

COMMEMORATION DAY AT LIVINGSTONE COLLEGE.—A successful commemoration day, the first for five years, was held at Livingstone College (Leyton, London, E.) on June 25th. The Bishop of Chelmsford, who presided, based his plea for financial support on the proved economy of giving to missionary workers a short medical training. Time and money were thrown away if a man was sent thousands of miles to die from preventable causes within a few weeks of his arrival. The twenty-fourth session of the College will commence on Oct. 6th, and will be preceded during the last four days of September by a short course of lectures on the personal care of health in the tropics.

IRISH MEDICAL ASSOCIATION.—The annual meeting of the Irish Medical Association was held on June 17th at the Royal College of Surgeons in Ireland, Dr. J. Marshall Day, the President, being in the chair. There was a good attendance. The report of the Council stated that the membership in 1919 increased from 629 to 677. A discussion took place on the remuneration for attendance on members of the Royal Irish Constabulary, and it was decided to advise members of the Association to give three months' notice of resignation of office unless a satisfactory answer was received from the Treasury. A discussion also took place on the question of the remuneration of poor-law medical officers, and it was resolved that without legislation the service would remain unsatisfactory, and that pending legislation the minimum salary should be at least £300 a year. The newly-elected President, Dr. E. Magennis, then delivered an address dealing with the present position of the medical profession in Ireland. In the afternoon the members of the Association, together with a number of other guests, were hospitably entertained at a garden party in the Zoological Gardens by the High Sheriff of Dublin, Dr. J. C. McWalter.

PRESENTATIONS TO MEDICAL MEN.—Dr. S. B. Coates, on his retirement after a service of 42 years as a member of the Belfast Dispensary Service, was recently presented by his medical colleagues with a Celtic silver rose-bowl; while Dr. James Taylor, J.P., dispensary doctor and medical officer of health of Tandragee, co. Armagh, was the recipient of an address in an illuminated album from some 200 friends and patients in Tandragee and the surrounding districts and a wallet of banknotes. Both of these medical men enjoy the respect and confidence not only of their patients and friends, but of the whole body of the profession in the North of Ireland.—Dr. W. Allen Daley, the medical officer of health for Bootle, who will shortly take up a similar position at Blackburn, was presented on July 23rd by the local medical fraternity, with a silver tea and coffee set as a mark of their esteem. In his reply Dr. Daley said that in some towns there was a disposition on the part of medical officers and local practitioners to regard each other as natural enemies. This was not in the interests of public health administration, which, to be successful, should have its foundations in domiciliary work.

FATAL ACCIDENT TO A MEDICAL WOMAN.—The death occurred on June 19th at Bromley, Kent, of Dr. Ethel Amy Mordaunt, following a bicycle accident. While her car which she habitually drove herself, was being repaired, Dr. Mordaunt attempted to do her rounds on a bicycle to which an auto-wheel had been fixed. She had had only one day's experience of its management when she apparently lost control of the machine, and was thrown on to her shoulder sustaining a fracture of the right humerus. Excision of the head was found necessary, and good progress appeared to follow the operation, but the wound became infected, and she died ten days after the accident at the age of 46. Dr. Mordaunt qualified L.R.C.P., L.R.C.S. Edin., L.R.F.P.S. Glasg., in 1908, and became M.D. Brux. in 1910, when she set up in practice at Bromley, where she was very well liked. She developed a large and successful practice, and found time to take an interest in local politics. She was a member of the Town Council from 1912 to 1919, and of the Education Committee. Her loss will be widely felt not only by her patients and personal friends but by the Bromley and Chislehurst Maternity Hospital, and many other local institutions and organisations to which she gave so generously of her scanty leisure.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, JUNE 22ND.

Sexual Offences Bill.

THE Sexual Offences Bill was committed to a Joint Committee of both Houses, which is considering the Criminal Law Amendment Bill and other Bills.

FRIDAY, JUNE 25TH.

Infantile Mortality in Mesopotamia.

Viscount GOSCHEN, speaking in a general debate on Mesopotamia, initiated by Lord ISLINGTON, said that he had only recently returned from the Middle East. He alluded to the difficulty of getting sufficient labour to develop Mesopotamia, and said that there was a most appalling infantile mortality there among the Arabs. They owed a great debt of gratitude to the British medical men at present in Baghdad, who in the short time they had been there had acted with the greatest vigour, and had tried to deal with this evil by the establishment of hospitals, by research, and by the spread of knowledge among the Arabs. They were endeavouring to induce the Arabs to come to the hospitals. But their efforts must take some time, and meantime there was a great shortage of labour which could only be met by the use of labour-saving appliances.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 23RD.

Pensions for Mothers.

Mr. ROBERT RICHARDSON asked the Minister of Health whether, in view of the opinion of the House that a scheme of pensions for mothers was desirable, he would appoint a committee to inquire into the details of such a measure, with a view to an agreed Bill being introduced at the earliest possible date.—Dr. ADDISON replied: I do not think that any useful purpose would be served by the appointment of a committee such as the honourable Member suggests.

Birth Statistics.

Mr. NEWBOULD asked the Minister of Health whether he could give the number of births in the first quarter of the present year and for the same quarter in previous years, or other figures which would show in a simple form the normal number of births in years before the war, the decrease during the war, and the increase since the war.—Dr. ADDISON replied: The births registered in England and Wales in the first quarters of the last 11 years were:—

1910	1911	1912	1913	1914	1915
221,684	223,585	222,600	216,629	217,414	221,523

1916	1917	1918	1919	1920
194,565	178,729	162,308	154,920	271,082

The Finances of Voluntary Hospitals.

Mr. BRIANT asked the Minister of Health if, in the event of grants from public money being made to voluntary hospitals, they would be conditional on the appointment of representatives of the public to the governing bodies.—Dr. ADDISON replied: In the event of any grants being made from public funds for the assistance of the voluntary hospitals, such conditions will be attached to the grants as are necessary to secure that they are properly expended. But I do not think that the honourable Member's suggestion would be effective for this purpose.—Mr. L. MALONE asked the Minister of Health what decisions had been given or what steps had been taken in regard to the acute financial status of many of the London hospitals; whether he was aware that the delay in settling this question was having a very bad effect on the staffs, new recruits hesitating to come forward for training when hospitals were insolvent, and further increasing the strain on the management due to the condition of these affairs; and would he take steps at once to give this matter immediate attention, and also see that necessary action was taken without delay?—Dr. ADDISON replied: As I informed my honourable friend on June 16th, I have given this matter my anxious consideration for some time. The Council of King Edward's Fund have decided to make an immediate distribution, of £250000 to hospitals. The question of the extent to which this grant will require to be supplemented from other sources and the best method of giving such further assistance as is necessary without discouraging voluntary subscriptions is under consideration, but the whole question involves many complex issues, and I am not at present in a position to make any statement.

THURSDAY, JUNE 24TH.

Irish Health Council Report.

Major O'NEILL asked the Chief Secretary to the Lord Lieutenant of Ireland if he could say what progress had been made by the Irish Health Council; and whether they had yet made any report as to the improvement of health conditions in Ireland.—Mr. HENRY (Attorney General for Ireland) replied: I would refer my honourable and gallant friend to the Report of the Public Health Council on the Public Health and Medical Services in Ireland which was presented to the House on June 14th.

Medical Officer of Health for Brecknock.

Mr. SIDNEY ROBINSON asked the Minister of Health whether he was aware that, owing to the delay of his department in granting approval, no medical officer of health and school medical officer had been appointed for the county of Brecknock, and that the health of the county was thereby endangered; whether he was aware that repeated letters and telegrams appealing for sanction to the appointment remained unanswered; and whether he would take steps to expedite the decision in this matter.—Dr. ADDISON replied: I regret that there has been some delay in dealing with this application owing to difficulties regarding the apportionment of the officer's salary among the several offices held by him. There is, however, no reason why he should not forthwith commence his duties, as the Ministry's consent, when given, will have effect from the date on which he commenced his duties. A letter was addressed to the County Council on June 21st.

Parish Medical Officers in the Highlands.

Mr. CATHCART WASON asked the Secretary for Scotland if he was aware of the hard lot of Poor-law medical officers in the Highlands and Islands; and if it was possible for him to make a further grant out of the Highlands and Islands Relief Act, a measure which was specially passed to afford poor parishes adequate relief before the war, and which was infinitely more needed now.—Mr. MUNRO replied: I am aware that parish medical officers in the Highlands and Islands perform a public service often in circumstances of great difficulty. As regards their financial position, I understand that a great improvement, particularly in the less remunerative practices, has been effected by the Highlands and Islands (Medical Service) Grant Act, 1913. The grants payable to practitioners under that Act have been increased to meet conditions caused by the war. I shall be glad to look into any particular case which my honourable friend may wish to lay before me.

FRIDAY, JUNE 25TH.

Blind Persons Bill.

The House went into Committee on the Expenses Resolution of the Blind Persons Bill. The resolution was agreed to by 118 votes to 18.

MONDAY, JUNE 28TH.

Proposed Select Committee on Voluntary Hospitals.

Lieutenant-Colonel RAW asked the Minister of Health if, having regard to the serious position of the voluntary hospitals throughout the country and the consequent prejudicial effect on the national health, he would consider the desirability of appointing a Select Committee of the House to consider what steps, if any, could be taken by Parliament to relieve this serious situation until the new scheme for health services was considered.—Dr. ADDISON replied: No, Sir. I do not consider that at this stage the appointment of a Select Committee is desirable.

Ex-Service Men in Pauper Asylums.

Mr. HURD asked the Prime Minister whether his attention had been called to a resolution of the National Council of the Evangelical Free Churches regarding the incarceration of ex-Service men in pauper asylums; whether any ex-Service men were so incarcerated; and what steps would be taken to secure their treatment in a way commensurate with their service.—Major TRYON (Parliamentary Secretary to the Ministry of Pensions) replied: My right honourable friend's attention had not been called to the resolution referred to, but I may say that any ex-Service man suffering from certifiable insanity who is confined in a county or borough asylum is by special arrangement treated, not as a pauper lunatic, but as a Service patient, if his condition is found to be due to his service in the late war. As a Service patient he is entitled to all the privileges of a private patient, the entire cost of his maintenance and treatment and of the special privileges accorded to him being borne by the Ministry of Pensions. I am satisfied that it would not be in the interests of the men themselves or of their relatives that they should be treated in special establishments devoted exclusively to ex-Service cases. I am, however, taking steps to assure myself that the present arrangements are in all cases working satisfactorily and are the best that can be made in the interests of these unfortunate men.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

SPECIAL NOTICE. (FOR FELLOWS ONLY.)

Wednesday, July 7th.

The ANNUAL GENERAL MEETING of Fellows of the Society will be held in the Barnes Hall at 5 P.M.

Business:

Election of President and other Officers and Council for 1920-21.
Annual Report of the Council.
Annual Report of the Honorary Treasurers.
Annual Report of the Honorary Librarians.

MEETINGS OF SECTIONS.

Thursday, July 8th.

OBSTETRICS AND GYNÆCOLOGY (Hon. Secretaries—J. S. Fairbairn, Herbert Williamson): at 8 P.M.

Specimens:

Mr. Barris: Primary Carcinoma of Fallopian Tube.
Dr. A. H. Richardson: Fibroma of Ovary with Warty Projections.

Paper:

Dr. Gordon Ley: The Pathology of Accidental Hæmorrhage.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, in the Barnes Hall, Royal Society of Medicine, 1, Wimpole-street, W. (by permission of the Royal Society of Medicine).

Short Film Demonstrations illustrating Post-Graduate Teaching in Medicine, Surgery and its Specialties will be given on July 5th, 9th, and 12th, by the Fellowship of Medicine, in conjunction with the British Film Institute. Open to all members of the Medical Profession.

MONDAY, July 5th.—5.30 P.M., (1) Major H. C. Marble: Approved Methods, Splints and Appliances for the Treatment of Bone and Joint Injuries.

FRIDAY.—5.30 P.M., (1) (1) Dr. Edward L. Keyes, jun.: Radical Cure of Undescended Testes. (2) Dr. A. Berger: Repair of Fracture of Jaw.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, July 5th.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
TUESDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2.30 P.M., Mr. Addison: Visit to Surgical Wards.
WEDNESDAY.—2 P.M., Mr. D. Armour: Visit to Surgical Wards. 2.30 P.M., Mr. Addison: Operations.
THURSDAY.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
FRIDAY.—2 P.M., Dr. Burnford: Visit to Medical Wards. 2.30 P.M., Mr. T. Gray: Operations.
SATURDAY.—2 P.M., Dr. Beddard: Visit to Medical Wards.
Daily:—10 A.M., Ward Visits. 3 P.M., In-patient Clinics and Operations.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, W.C. 1.

MEDICAL SCHOOL.

MONDAY, July 5th.—2-3.30 P.M., Out-patient Clinic: Dr. Collier. 3.30 P.M., Dr. Saunders: Demonstration of Ward Cases.
TUESDAY, July 6th.—2-3.30 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Dr. Hinds Howell: Trigeminal Neuralgia.
WEDNESDAY, July 7th.—2 P.M., Dr. Grainger Stewart: Peripheral Nerve Injuries. 3.15 P.M.
THURSDAY, July 8th.—2-3.30 P.M., Out-patient Clinic: Dr. Farquhar Buzzard. 3.30 P.M., Dr. Kinnier Wilson: Demonstration of Ward Cases.
FRIDAY, July 9th.—2-3.30 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Dr. James Taylor: Demonstration of Ward Cases.
Fee for Post-Graduate Course £7 7*s*. C. M. HINDS HOWELL, Dean.

MALE LOCK HOSPITAL, Dean-street, W.

MONDAY, July 5th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, July 5th.—2.30 P.M., Mr. J. B. Banister: Gynæcological.
TUESDAY.—9.45 A.M., Lieut.-Col. R. H. Elliot: Selected Eye Cases and Operations. 2.30 P.M., Mr. C. H. Hayton: Laryngological; Dr. J. Metcalfe: Radiology.
WEDNESDAY.—2.30 P.M., Dr. W. J. Oliver: Dermatological.
THURSDAY.—2.30 P.M., Mr. N. Fleming: Ophthalmological. Dr. J. Metcalfe: Radiology.
FRIDAY.—2.30 P.M., Dr. C. E. Sundell: Diseases of Children.
SATURDAY.—3 P.M., Mr. H. W. Carson: Selected Surgical Cases.
Daily:—2.30 P.M., Operations, Medical and Surgical Clinics, &c.

ST. MARYLEBONE GENERAL DISPENSARY, 77, Welbeck-street, Cavendish-square, W.

Post-Graduate Course on Infant and Child Welfare.

TUESDAY, July 6th.—10.30 A.M., Dr. E. Pritchard: Practical Demonstrations on the Management and Feeding of Infants and Young Children—Lecture XI., The Treatment of the Heat Regulating Functions.
THURSDAY.—3 P.M., Lecture XII., The Feeding of Children between Nine Months and Two Years.

UNIVERSITY OF LONDON.

Advanced Lectures in Physiology to Students of the University and others interested in the subject.

A Course of Eight Lectures on the Bio-Chemistry of Sterols will be given in the Physiological Laboratory of the University, South Kensington, S.W.

TUESDAY, July 6th.—5 P.M., Lecture VIII., Mr. J. A. Gardner.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street (behind Whitworth Park).

THURSDAY, July 8th.—4.30 P.M., Dr. N. C. Haring: Ozæna.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

DALEY, W. A., M.D. Lond., D.P.H., has been appointed Medical Officer of Health for Blackburn.

GIBSON, R., M.D., Ch.B. Edin., Honorary Dermatologist, Salford Royal Hospital.

GOTLA, F., L.R.C.P. & S. Edin., L.F.P.S. Glasg., Attending Medical Officer, The Western Dispensary, Rochester Row, S.W.

PEARCE GOULD, E. L., M.D., M.Ch., F.R.C.S., Assistant Surgeon to the Middlesex Hospital.

SHELLEY, R., M.B., B.S. Lond., Assistant Medical Officer to the Middlesex County Council.

SYME, W. S., M.D. Edin., F.R.F.P. & S. Glasg., Surgeon to the Throat and Nose Department, Western Infirmary, Glasgow, and Lecturer on Diseases of the Throat and Nose, Glasgow University.

WOOD, F. T. H., M.D. Lond., D.P.H., Medical Officer of Health for Bootle.

St. Thomas's Hospital: RUSSELL, H. B., M.B., B.S. Lond., M.R.C.P., Resident Assistant Physician; REECE, L. N., M.B., B.S. Lond., F.R.C.S. Eng., Resident Assistant Surgeon; FOLEY, W. B., M.B., B.S. Lond., Resident Orthpædic House Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: STEVENSON, J., M.B., B.Ch. R.U.I. (Redditch); YOUNG, H. G. K., M.R.C.S., L.R.C.P. Lond. (Braintree); GALPIN, C. G., M.R.C.S., L.R.C.P. Lond. (Frome).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen, Rowett Research Institute in Animal Nutrition.—Physiologist. £400.
Battersea General Hospital (Incorporated), Battersea Park, S.W.—Res. M.O. £200.
Benenden National Sanatorium, Kent.—Asst. M.O. £250.
Birmingham General Hospital.—Res. M.O. £155.
Birmingham and Midland Eye Hospital.—Res. S.O. £200.
Bloomsbury Dispensary, 12, Bloomsbury-street, W.C.—Res. M.O. £250.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £150.
Bradford, Odsal Sanatorium.—Res. M.O. £350.
Bradford Royal Infirmary.—Res. Surg. O. £250.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £150.
Bristol, Cossham Memorial Hospital, Kingswood.—Res. M.O. £200.
Bristol General Hospital.—Cas. H.S. £175.
Bristol Royal Infirmary.—H.S., and Cas. O.
Cardiff, King Edward VII. Hospital.—Two H.S.'s. £200.
Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S. £250.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—Res. M.O. £250.
Colchester, Essex County Hospital.—H.P. £200.
Cornwall Education Committee.—Female Asst. Sch. M.O. £500.
County of London.—Coroner for North-Eastern District. £1500.
Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £200.
Dorset County Council.—Asst. County M.O. £500.
Dreadnought Hospital, Greenwich.—H.S. £100.
Durham County Hospital.—H.S. £200.
Federated Malay States.—Radiologist. £840–£980.
Galway, University College.—Prof. of Anat. £658.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. £175.
Great Northern Central Hospital, Holloway, N.—Cas. O. £200. Also H.S. £150.
Hackney Union Infirmary.—Jun. Asst. M.O. £331.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Cas. S.O. £150.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P. £100. Also Asst. P.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50.
Huddersfield Royal Infirmary.—Sen. H.S. £250.
Hull Royal Infirmary.—Asst. H.S. £150.
Isle of Ely County Council.—Clin. Tuberc. O. and Asst. M.O.H. and Sch. M.O. £500.
Italian Hospital, Queen-square, W.C.—H.P. £150.
Johannesburg, South African School of Mines, &c.—Professor of Pharm. £1000.
Leeds Education Committee.—Asst. Sch. M.O. £500.
Leicester Royal Infirmary.—Two H.S.'s. £200.
London County Mental Hospital Service.—Sixth and Seventh Asst. M.O.'s. £300.
London County Council, Public Health Department.—Asst. M.O.'s. £400.
London Fever Hospital, Liverpool-road, Islington, N.—Res. Med. Supt. £400. Also Asst. Res. M.O. £200.
London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. £200. Asst. Res. M.O. £120.
Maidstone, West Kent General Hospital.—H.S. £250.
Manchester, Ancoats Hospital.—Res. M.O. £150. Two Jun. H.S.'s. £100.

Manchester Royal Infirmary, Roby-street.—H.S. £50 first six months, £100 second.
Manchester University.—Lecturer in Anatomy. £500.
Middlesex Hospital, W.—Asst. P. Also Cas. M.O. Also P. for Diseases of Skin.
Norwich City.—Asst. Sch. M.O. and Asst. M.O.H. £560.
Poplar Metropolitan Borough.—Asst. Tuberc. O. £500.
Portsmouth County Borough.—Asst. M.O.H. and Chief Tuberc. O. £500.
Prince of Wales's General Hospital, Tottenham, N.—Jun. H.P. £120. Also Hon. Asst. S.
Queen Mary's Hospital for Children, Carshalton, Surrey.—Junior Asst. M.O. £515 6*s.*
Reading, Royal Berkshire Hospital.—H.S. £200.
Richmond Royal Hospital.—Hon. M.O.
Rotherham Hospital.—Jun. H.S. £150.
Royal Free Hospital, Gray's Inn-road, W.C.—H.P. and Second H.P. and Anæsth. £50 each. Also Hon. Anæsth. and Asst. S.'s.
Ryde, Royal Isle of Wight County Hospital.—Res. M.O. £250.
St. Leonard's Hospital, 204, Hoxton-street, E.—Third Res. M.O. £325.
St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum, City-road, E.C.—H.S. £150.
St. Thomas's Hospital.—Asst. Radiologist. £500.
Salisbury General Infirmary.—H.S. and Asst. H.S. £200 and £150.
Seamen's Hospital, Albert Dock, Connaught-road, E.—H.S. £100.
Sheffield Royal Hospital.—Asst. Cas. O. £150.
Sheffield Royal Infirmary.—H.P. £150.
Sheffield University.—Demonstrator in Anat. £350.
Southampton County Borough.—Asst. M.O.H. £600.
Stafford, Staffordshire General Infirmary.—H.S. £250.
Townsville, Queensland, Australia.—Director, Institute of Tropical Medicine. £1200.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. £100.
Warrington Infirmary and Dispensary.—Jun. H.S. £200.
Warrington, Whitecross Institution and Hospital.—Asst. Res. M.O. £300.
West London Hospital, Hammersmith, W.—H.S. and H.P. £50.
Westminster Hospital, Broad Sanctuary, S.W.—H.P. Also Fourth Asst. S.
Wigan Infirmary.—Sen. H.S. £250.
Wolverhampton and Staffordshire General Hospital.—H.S. £200.
Worcestershire County Council.—Asst. County M.O.'s and Sch. Oculist. £500 each.

The Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Okehampton, Wymondham, and at Penygroes.

Births, Marriages, and Deaths.

BIRTHS.

PARKINSON.—On the 24th June, the wife of John Parkinson, M.D., 4, Devonshire-place, W.1, of a son.
TASKER.—On June 23rd, at 58, New Cavendish-street, W.1, to Adela, wife of H. L. Tasker, M.D.—a daughter.

MARRIAGES.

ATTERIDGE—COLE.—On June 26th, at the Church of the Sacred Heart, Hampton Wick, Kevin Doyle Atteridge, M.R.C.S., L.R.C.P., to Arbery, second daughter of Mr. and Mrs. Herbert Cole.
BLUETT—CAESAR.—On June 26th, at St. Andrew's, Ashley-place, S.W., Dr. George Mallack Bluett, formerly of Palace-gardens-terrace, to Emily Henrietta, daughter of the late Mr. and Mrs. J. Caesar, of Tunbridge Wells.
BROWN—COPP.—On June 23rd, at S. Andrew's, Willesden Green, Alexander Middleton Brown, M.A., M.D., D.P.H., to Clara Ethel, eldest daughter of Mr. and Mrs. W. Copp, Cricklewood.
MOSSE—WILSON.—On June 23rd, at St. Andrew's Church, Norwich, Colton Grimley Tenison Mosse, M.R.C.S., L.R.C.P., to Florence Evelyn, only daughter of Mr. and Mrs. A. N. Wilson, of Norwich.

DEATHS.

DOVE.—On June 26th, suddenly, at Brightside, Crouch End-hill, Dr. Aug. C. Dove, aged 64.
HIND.—On June 21st, Lieut.-Col. Wheelton Hind, T.D., M.D., F.R.C.S., F.G.S., of Roxeth House, Stoke-on-Trent.
KILNER.—On June 23rd, at Black Gang, Walter John Kilner, M.B., M.R.C.P., of Ladbroke-grove and Bury St. Edmunds, aged 73.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, LTD., London.
God's Price. By Maud Leeson. Pp. 314. 7*s.* 6*d.*

ARNOLD, EDWARD, London.
Orthopædics for Practitioners: An Introduction to the Practical Treatment of the Commoner Deformities. By P. B. Roth, F.R.C.S. Pp. 195. 10*s.* 6*d.*
Cookery for Dyspeptics. By the late Dr. George Herschell. Pp. 56. 2*s.* 6*d.*

ASH AND CO., London.
Guy's Hospital Nursing Guide. Edited by the Matron. 1920. Pp. 228. 3*s.*

ARROWSMITH, J. W., Bristol.
Neurological and Other Papers reprinted from the Writings of J. Michell Clarke, M.D., Lieutenant-Colonel, R.A.M.C. T.F. Pp. 263. 10*s.* 6*d.*

BARTH, JOHANN AMBROSIUS, Leipzig.
Deutscher Chirurgen-Kalender. By Prof. A. Borchard and Dr. Brunn. Pp. 288. M.36.
Die Deutsche Chirurgie im Weltkrieg. 1914 bis 1918. By Prof. A. Borchard and Prof. V. Schmieden. Two vols. Pp. 938. M.102.

BELL, G., AND SONS, London.
The Child Welfare Movement. By Janet E. Lane-Claypon, M.D., D.Sc. Pp. 341. 7*s.*
Hints on Royal Auction Bridge. By Lieut.-Col. S. H. Hingley. 2nd ed. Pp. 116. 3*s.* 6*d.*

BUTTERWORTH AND CO., London, India, Canada, and Australia.
A Text-book of Medical Jurisprudence and Toxicology. By Roi Bahadur Jaising P. Modi, L.R.C.P. & S. Edin. With introduction by Lieut.-Col. W. Young, I.M.S. Pp. 576 + cxxx. Rs.10.

CHAPMAN AND HALL, London. WILEY, J., AND SONS, New York.
Food Inspection and Analysis. By A. E. Leach, S.B., and A. L. Winton, Ph.D. 4th ed. Pp. 1090, and 41 plates. 45*s.*
France Afflicted: France Serene. By A. de Navarro, F.S.A. Pp. 211. 7*s.* 6*d.*

HILTON AND CO., Calcutta. SIMPKIN MARSHALL, London.
A Treatise on Materia Medica and Therapeutics. By the late R. Gosh. 8th ed. by Lieut.-Col. B. H. Deare, I.M.S., and B. N. Gosh, F.R.F.P.S. Glasg. Pp. 698. 9*s.*

JOUVE ET CIE, Paris.
Les Allures Cliniques de la Syphilis et les Formes de Paralysie Générale Consécutive. By Dr. L. R. Sanguineti. Pp. 291. Fr.15.

MARLBOROUGH, E., London.
Norwegian Self Taught. By Prof. I. Gröndahl. Pp. 128. 3*s.*

MASSON ET CIE, Paris.
Syphilis de l'Utérus et des ses Annexes Trompes—Ovaires, Glandes Mammaires. Par le Dr. Ozenne. Pp. 226. Fr.12.

ST. CATHERINE PRESS, Stamford-street, London, S.E.
Adenoids and Enlarged Tonsils Curable Without Operation. By J. Kynaston, Lieutenant-Colonel, R.A.M.C. (R.P.). Pp. 40. 1*s.*

SAUNDERS, W. B., CO., LTD., London and Philadelphia.
Diseases of Infants and Children. By J. P. Crozer Griffith, Professor of Pediatrics in the University of Pennsylvania, Philadelphia. Vol. I., pp. 885.; Vol. II., pp. 657. Per set 72*s.* net.
Pasteur—The History of a Mind. By Prof. Emile Duclaux. Translated by Erwin F. Smith and Florence Hedges, Pathologists of the U.S. Department of Agriculture. Pp. 363. 21*s.* net.
Everyday Mouth Hygiene. By Joseph Head, M.D., D.D.S. Pp. 63. 5*s.* net.
The Nation's Food: a Statistical Study of a Physiological and Social Problem. By Prof. Raymond Pearl, Ph.D., Sc.D. Pp. 274. 16*s.*

UNIVERSITY OF LONDON PRESS, London.
The Circulatory Failure in Diphtheria. By M. Esther Harding, M.D. With introduction by Sir James Galloway, K.B.E., M.D. Pp. 176. 10*s.* 6*d.*
Education for Self-Realisation and Social Service. By F. Watts, M.A. Pp. 275. 7*s.* 6*d.*

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N.—National Baby Week Council, Lond.; North-East London Post-Graduate College; National Society for the Prevention of Cruelty to Children, Lond.
O.—Oxford Ophthalmological Congress, Hon. Sec. of.
P.—Dr. C. F. Pedley, Timperley; People's League of Health, Lond.; Mr. J. H. Parsons, Lond.
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Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Notes, Short Comments, and Answers to Correspondents.

SOME RACIAL PROBLEMS, SOCIAL EVILS, AND MODERN CRUSADES.[1]

BY ROBERT B. WILD, M.D., M.SC., F.R.C.P.,

DEAN OF THE MEDICAL FACULTY, UNIVERSITY OF MANCHESTER, ETC.

THE need for a clear appreciation of the factors involved in racial evolution is shown by many modern movements designed to improve the conditions of life, the welfare of the individual, and to produce a strong and virile race; on every hand there are crusades against predominant diseases, admitted or supposed social evils, and various forms of racial degeneration. One of my former teachers—a great master of medicine—Sir W. Roberts, used to impress upon us as the most important maxim in therapeutics never to order a dose of medicine without considering, "Can it possibly do harm?" This admirable caution is equally advisable before applying remedies to the body-politic as well as to the individual, for we must remember that the present conditions of life are the result of generations of growth and represent a balance of factors which has been slowly arrived at and which may more easily be disturbed than readjusted.

While I am far from wishing to make any attack upon these crusades, and least of all upon the sincere, well-meaning, and often altruistic persons who lead them, I do think it is important to consider their racial as well as their individual effects. The welfare of a particular individual may not always be coincident with the best interests of the nation or race to which he belongs.

The Regeneration of the Race.

The first racial problem which has to be faced is the need of every nation for a due supply of healthy children to replace the wastage of war and its aftermath of disease and starvation. Before the war the falling birth-rate of almost all the more highly civilised nations was a cause of anxiety to many. Possibly an increasing complexity of civilisation with greater demands for the development of the nervous system may have some influence upon the capacity for reproduction. Also the greater demands of social life and the expense and difficulty of maintaining and housing a family tend to raise the age of marriage until a sufficient income is assured with a consequent shortening of the child-bearing period. In many countries also these difficulties lead to the deliberate limitation of families or the procuring of abortion by illegitimate means. It is possible that in the future the community may be driven to protect itself by insisting upon a registration of pregnancy; even now in Scotland under certain circumstances the concealment of pregnancy is an indictable offence.

One of the handicaps which all nations have to carry is the burden of supporting unproductive members of the community or of maintaining during the period of growth and adolescence a number of children who die before they can repay to the nation, by their work, the cost of their rearing and education. Any widespread disease which removes individuals at a time when their working powers are on the wane and before they become a burden on the community is an advantage, and a disease which destroys the individual in early adolescence is a serious handicap.

Tuberculosis and Cancer Contrasted.

The crusade against tuberculosis can do nothing but good. I think, however, that too much is made of the bacillus and too little of the environment; it is pre-eminently a case where preventive medicine has an open field. The great increase of tuberculosis which appears to be so marked a feature in the countries of Central Europe which have suffered most from malnutrition, and its progressive increase as food became less and less plentiful, will, as its special incidence is carefully studied, undoubtedly lead to a better knowledge of its ætiology, and we may find that a deficiency of some vitamine factor in the food is responsible for a decrease in the resisting power of the tissues to the invasion of the tubercle bacillus. In this connexion it is interesting to note a paper by Dr. B. G. M. Baskett,[2] in which he shows how the death-rate from tuberculosis through a long series of years varies with the rise and fall of real wages, by which he means the relation between the wage paid and the price of food.

We may contrast with tuberculosis another disease of great importance—namely, cancer—against which we have also a crusade. Although cancer may attack patients at all ages, the great majority of cases occur in later middle life, when most of the sufferers have already done the greater and most productive part of their life's work. Their deaths at a time when they are likely soon to become a burden on the community lighten the load of unproductive consumers which the community has to carry, and cancer is therefore by no means an unmixed evil so far as the national welfare is concerned. If cancer was found to be curable or preventable to-morrow one of the results would be within a few years an enormous increase in the cost of old-age pensions. Similarly, conditions such as arterio-sclerosis are disastrous for the individual, but not to the race. An increase in the number of those who linger on to die by the slow process of senile decay is not a gain to the nation, and it has been said that "those who are noted as centenarians are rarely noted for anything else." Mere length of days without corresponding length of service is not a desirable aim from the point of view of racial welfare.

Venereal Disease.

The crusade against venereal disease, though of great benefit to the individual sufferer, may do more harm than good. I do not want to enter to-day into the question of prophylactic packets and cleansing stations, but would merely quote the old tag, "The means at hand to do ill deeds oft makes the ill deeds done." The true remedy for venereal disease, and also for that other social evil prostitution, is the encouragement of early marriage and the institution of such conditions of living as to facilitate the rearing of a family. Tennyson put his finger on a great evil when he wrote over 60 years ago—

> "Cursed be the social wants that sin against the strength of youth
> Cursed be the social lies that blind us to the living truth."

Many years ago I was much struck by the curious fact that venereal disease was particularly widespread in the most highly civilised and advanced nations of the world, and was forced to the conclusion that at any rate racial progress is not incompatible with considerable syphilitic infection. The association of syphilisation with civilisation is probably due to the fact that extensive promiscuity of sexual relations can only take place in comparatively large communities, and it is only in such communities that we find the combination of individuals for mutual defence, mutual help, and specialisation of function, which is the first foundation of civilisation. In a community where the competition is keen the members of it infected by venereal disease—generally speaking those individuals whose passions are strongest and moral control weakest—are at a disadvantage, and in comparison with the non-infected they are likely to leave fewer offspring and these less likely to reach a healthy maturity. Venereal disease therefore, if not too widespread, is not an unmixed evil for the race.

Eugenics.

Another crusade designed to raise the quality of the population is the cultivation of eugenics. As yet, however, any general application of the principle of eugenics is wanting, and it is likely to remain wanting until there is some agreement as to what is the ideal for which it is desirable to breed. The principles of heredity are still largely speculative, but in practice all breeders know that the first requisite for success is to have a clear idea of the object to be attained; for example, we may breed horses or pigeons for speed, flowers for colour or scent. But the aims of the eugenic expert in the regulation of human breeding are not yet agreed on. Some would breed for physical development, some for "the will to power," some for mental qualities. Among the latter, disagreement soon comes in, for to some the desirable type appears to be the quick alert mind ready to see immediate issues and turn them to practical use; to others the more highly developed intellectuality which works more slowly, takes longer views, and is the basis of scientific progress; while for a third group the progress of the world is bound up in a more highly developed emotional capacity with an advance of the spiritual life towards the religious ideal and of the altruistic as opposed to material interests. It may be possible to breed with more or less success for any one of these ideals, but not for all, and it is futile to expect any general agreement on the choice to be made. There is an old Lancashire saying that "It taks aw sorts o' foke to mak a world," and probably our present methods of sexual selection give, on the whole, as good results as would be obtained by a more conscious and deliberate method.

Drug Addictions.

I now pass on to another social evil of the widest importance and the subject of endless controversy—that of drug addictions. It is not always easy to say what is a drug addiction or that it is necessarily an evil. For example, the medicinal use of thyroid or the dietetic use of purins or alcohol may lead to habits of which the border is hard to

[1] Abridged from a Presidential Address delivered before the Manchester Medical Society, Feb. 4th, 1920.

[2] Brit. Med. Jour., Jan. 10th, 1920.

define. However, I wish to confine myself to a few of the more important drugs, producing either a narcotic or a stimulant action on some part of the central nervous system or the autonomic ganglia. Many hypotheses have been put forward as to how drug addictions arise, and every one of them may be right. I only wish to mention four. The late Dr. Norman Kerr looked upon the addiction to drugs as a definite disease closely allied to insanity, to which he gave the name "narcomania." The late Sir William Roberts classed the narcotics and stimulants in habitual use as "euphoric agents," and put down their employment simply to the pleasurable sensation of well-being which temporarily followed their use. Dr. Harrington Sainsbury says: "We fly to drugs and we initiate habit either to escape a distress of mind or of body, or to secure a pleasure; in some cases both objects are attained." This is often true, but I agree with Herbert Spencer's statement that in many people in a civilised state "the activities are cerebral in a degree beyond that to which the constitution of the race is adapted." To many people even the ordinary tasks of daily life produce a sense of exhaustion, which is temporarily relieved either by a narcotic which dulls the highest perceptive powers or by a stimulant which rouses the over-fatigued brain to additional effort; some find the one method, some the other, the more effective.

At first probably recourse to these drugs is only made to relieve an exceptional strain or a blighting monotony of occupation, but as the indulgence is repeated more and more frequently the habit is acquired and the regular action of morphine, cocaine, alcohol, caffeine, or nicotine becomes essential to that smooth working of the functions of the body which gives rise to the feeling of euphoria or well-being. A stopping of the habitual drug is like the stopping of the lubricant in a machine; there is in working friction instead of smoothness, and the result of the disturbed functional activities is that severe symptom-complex of deprivation which we know as a "craving," and which leads to a larger dose of the drug by which the symptoms are quickly relieved. Thus the victim is led deeper and deeper into the power of the drug until all interest in life beyond that of satisfying his craving is gone, and to do this successfully he counts the world well lost. When this stage is reached his or her value as a citizen is gone, and, though it may seem a hard saying, the community is best served by his early death.

Of the narcotic drugs by far the most important is alcohol. The high-water mark of alcoholic consumption in this country—one of the highest in the world—was reached in 1900, when the estimate per head of total population was 32 gallons of beer, 1·22 gallons of proof spirits, and 0·42 gallons of wine. In 1913, the last full year before the war, it had fallen to 27 of beer, 0·67 of spirits, and 0·24 of wine. Later statistics are of no value as they are vitiated by variations in the alcoholic strength and the absence from the country of so large a proportion of men. It is now proved that alcohol is not a stimulant but a selective narcotic, which paralyses certain centres earlier than others, notably the centres for the perception of pain and discomfort, whether bodily or mental, and also the centres of inhibition.

Of the evil effects of the abuse of alcohol there is no need to speak, but we may ask whether there are any compensating advantages to the moderate users? First, of course, there is some food value. Alcohol can replace a considerable proportion of the carbohydrates and fats of the food, and it may also aid appetite and digestion, and enable otherwise unpalatable food to be enjoyed. In many monotonous occupations, and in times of stress, alcohol can enable work to be carried on for a time which would otherwise be impossible. It will, when taken after work, afford relaxation to the mind and promote a feeling of euphoria. It makes many men contented with their work who would otherwise rebel. One result of its action on the brain is by relaxing inhibition to promote freer social intercourse and mutual coöperation. It is not for nothing that dinners play so large a part in raising funds for charitable objects.

The Effect of Alcohol on the Race.

As regards the effect of alcohol upon the race it was long ago said that "alcohol was nature's finest sieve for the sifting of the fit from the unfit," and we can easily see that the consumers of alcohol are handicapped in the race for the highest places. First, there is the economic handicap, for as a food alcohol is expensive, and those who buy it have the less to spend on other necessaries which may be to their advantage. Secondly, though it may enable men to do work which they could not do without its aid, yet work done under its influence is less perfectly done, and they fail to reach the highest standard. Thirdly, those who from lack of self-control give way to excess in its use fall lower and lower in the social scale. As the pronounced alcoholic families tend also to die out in the course of a few generations, we can see that the indefinite continuance of the race is continued in the main by those members of the nation who are able to withstand the temptations of alcohol. Whether these and possibly other advantages outweigh the loss to the community, occasioned by the incapacity, sickness, and early death of those who take excess, must be a matter of individual opinion, but we shall all, before long, have to act upon our convictions as to whether the use of alcohol in this country shall be prohibited or allowed. Meanwhile, we shall all watch with the greatest interest the experiment now on trial in America. I doubt whether prohibition in this country would deprive the habitual alcoholic of his stimulant. We have had for some years a prohibition as close as possible of opium, morphia, and cocaine, and yet we find a considerable number of victims to these drugs. Where a law is opposed to the feelings of any large number of the community it is certain to be evaded, as in the old days when smuggling carried with it but little social stigma, and few people scrupled to take advantage of smuggled goods when they had the chance; a somewhat similar and recent example of the same kind is the law passed a few years ago to restrain juvenile smoking, and we all know the futility of the law designed to prevent unqualified dental practice. Any law which is evaded is worse than none, as its evasion produces a general lowering of that respect for law which is the basis of government.

I should like to quote you the conclusions arrived at by Dr. Harrington Sainsbury in his book on "Drugs and the Drug Habit"; he says:—

"For the principle of local option there is much to be adduced, but when all is said and done it is a tyranny—the tyranny of a majority, and when there is a bare preponderance it may be an unjustifiable tyranny. May it therefore be commended to the prohibitionist or abolitionist: 1. That temperance promises a higher moral yield than total abstinence. 2. That the aim of all education should be to develop character, to create a people strongwilled for good. 3. That it is possible to pay too high a price for sobriety and that this excessive price is paid when liberty of action is forfeited."

Of all narcotics ethyl alcohol is the least harmful, and we have already had evidence that its prohibition is likely to be followed by a resort to more harmful drugs.

Other Drugs.

Opium and morphia are the cause of even more serious results to the individual, but the number affected in this country is too small to have any appreciable effect on the race. Indian hemp, either as hashisch, gunja, or churrus, has never taken root in England, but it is widely used in our Asiatic dependencies and the neighbouring countries, and produces effects which are in some respects intermediate between those of alcohol and opium, with a marked tendency to cause insanity.

Of the other narcotics which give rise to habit I will only mention chloral hydrate, veronal, and sulphonal. It is less commonly known that acetanilide, in the form of headache powders, may give rise to a habit, and that aspirin is becoming increasingly popular as a pick-me-up. What the consequences of habitual aspirin taking may eventually be I do not know, as it is only of recent development, but I have seen cases of distinct craving for it. I want especially to call attention to this class of drugs, as the habit of taking them seems to be on the increase of late years, and the interesting point arises as to whether there is any connexion between this increase and the decrease in the consumption of alcohol since 1900.

Of nerve stimulants cocaine is probably the worst drug addiction we have to deal with. It is a direct stimulant to the brain, and the sense of euphoria produced is more intense than that produced by any other drug, hence its great seductive power. I have seen many cases, and three past students of my own either committed suicide or had to be sent to an asylum as a result of cocaine. The oxy-purin bases, caffeine, theobromine, and theocine, are so closely allied to the food constituents and so universally taken that many people do not recognise that they are taking drugs at all, and, moreover, they are drugs of comparatively recent introduction to our race. It is also worth noting that allied purin compounds, such as xanthin, hypoxanthin, and guanin, are present in considerable quantity in meat extracts, which are also coming more into use as popular stimulants and beverages. Physiologically the effects of a cup of beef tea or bovril is almost identical in kind with the effects of a cup of tea or coffee or cocoa.

It is an interesting subject of speculation how mankind in so many parts of the world has discovered and used the oxy-purin alkaloids, as the plants containing them have no characteristic smell or taste which might betray their presence to uncivilised people, and yet we find them in use all over the tropical parts of the world where perhaps the exhaustion produced by excessive heat is best relieved by a nerve stimulant. These bases are pure cerebral stimulants, especially to the intellectual faculties, they remove the sense of fatigue, and often enable work to be done under adverse conditions. Unlike alcohol, they do not impair the quality of the work.

Are there any bad effects to set off against these benefits? There is the possibility that by allowing work to be continued when the feeling of fatigue is an indication that rest is urgently required may lead to a nervous breakdown. Many

authorities also consider that the coincidence of a large increase of functional nervous diseases, especially neurasthenia, with the increased consumption of tea is more than a coincidence. Also a persistent high blood pressure often said to result in early arterio-sclerosis. Of the bad effects of excessive tea and coffee drinking we have all had experience, and I have seen several cases of acute poisoning with intense restlessness, garrulity, and absence of sleep, with a pulse of 160, followed by extreme exhaustion.

Another drug addiction is that of nicotine, next to caffeine the most universal of all, and which is also the subject of a crusade, which apparently makes little headway.

Conclusion.

Probably neither caffeine nor nicotine is a serious handicap to the nation at present, for our competitive nations are equally affected by these addictions. If the use of these drugs enables more and better work to be done and diminishes the dependence of old age by an earlier wearing out of the arterial tissues the nation will gain at the cost of the individual, and in peace as in war the welfare of the individual should be sacrificed for the good of the race.

In trying to bring before you some of the problems with which we are faced at the present time I suggest that it is necessary for us as medical men to take a broad and unsentimental view of the issues which will confront us in our work. If in the future the work of a medical man is to be more preventive than curative he will have to think more of the community and of the race than he has done in the past without thinking less of the individual.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL: THE PUPILS' REGISTER.

THOSE who are interested in the hospital and school will be glad to hear that their register is now ready for the press, and the Dean will be glad if anyone who wishes to subscribe for a copy will communicate with him. It is difficult at the present time to give any indication as to how much the book will cost, but it seems impossible to expect that it can be published at less than one guinea and it may very likely cost 30s. The book consists of a transcription of all the names (6500 in all) on the pupils' register from 1752 to 1918, with annotation notes on the men about whom it has been possible to find out anything. Among the famous names included in the work will be found those of John Hunter, Mathew Baillie, Thomas and Robert Keate, Sir Benjamin Brodie, Sir Prescott Hewett, Henry Gray, Frank Buckland, Edward Jenner, Sir Everard Home, and the two Gunnings; among those St. George's pupils whose names are not so likely to be known as alumni of the old school occur the names of Thomas Addison, Bence-Jones, John Gale Jones (the political agitator at the time of the French Revolution), Charles and George Hawkins, H. W. Bellew, and Aloyse Sprenger. It is hoped that it will be possible to reproduce photographic representations of the entry cards of old pupils, of which the school possesses a very complete collection of the various types of cards issued at different times, and also the house surgeon's certificate of 1769, presented to Thomas Keate by the board of governors. Dr. G. C. Peachey has written a foreword on medical education in the metropolis during the eighteenth century, in which he incorporates the names of those early pupils of the hospital whose names are to be found in the minutes of the weekly board, with annotation notes on many of them. The Dean would be glad to have the names of intending subscribers before the end of the year.

LOCAL SELF-GOVERNMENT AND SANITATION IN BIHAR AND ORISSA, 1918–19.

THE local administrative measures that are now delegated to the municipal and district authorities in the provinces of India are gradually becoming operative on the material and sanitary conditions of the people, who until recently were almost entirely without knowledge of, or interest in, such matters. In Bihar, at the elections of municipal commissioners in the towns, the number of votes recorded in nearly all cases exceeded 60 per cent. of the electorate, and the number of meetings held in most instances fulfilled the statutory requirement. Progress in action is, however, slow, and the Lieutenant-Governor regrets to note the apathy in many municipalities, of which 46 out of a total of 56 now possess autonomy. In Patna, however, the chief city of the province, which has a population of over 136,000, there was a marked change, the elections being hotly contested. The incidence of taxation in the province averages 1 rupee 12 annas per head (say, 2*s*. 4*d*.), which cannot be considered excessive; the expenditure on conservancy operations amounted to Rs. 875,015 (say, £58,334). It is unfortunate that there should be a dearth of men qualified to hold the appointment of health officer: out of 12 municipalities, for which the Government have undertaken to pay the full cost of the appointment, only 6 possess this necessary officer. It is hoped that shortly improved conditions may be offered to properly qualified men. In the rural areas of the province the growth of self-government is naturally slower; it depends, first, on the extension of the elective system to local boards; and, secondly, on the formation of "union committees," which have power to enforce adequate measures for the preservation of the public health. The efficiency of these committees "depends largely on the existence of a public spirit, which is as yet less common than it ought to be." *Chi va piano va sano* is probably as true here as elsewhere.

THE DANGEROUS REVOLVER AGAIN.

MANY fatal accidents as well as crimes due to the carrying of revolvers have been chronicled in THE LANCET, and presumably many cases of injury remain unrecorded by the press. The following is a good example of the ownership of pistols by persons who, to put the case mildly, can give no good excuse for carrying or using such weapons. A carman charged with murdering his brother by shooting him was recently acquitted at the Central Criminal Court, and it is possible, if not probable, that his account of the affair was a true one. He said that he was standing drink to his brother, and that having called for five glasses of beer he put his hand in his coat pocket to find a Treasury note wherewith to pay. He "did not know that the revolver was in his pocket," and in pulling it out discharged it, with the fatal result stated. A carman with Treasury notes and a forgotten revolver loose together in the pocket of his coat, and in a public-house, sounds as if he might be dangerous to more than his personal friends. To prevent the carrying of weapons may not be easy; at present it is not unlawful. In the instance cited the man may have failed to have a gun-licence, but subject to that he has been acquitted of manslaughter as well as of murder, and has committed no offence.

LEBANON MENTAL HOSPITAL.

Dr. H. Watson Smith, O.B.E., director of the Lebanon Hospital for Mental Diseases, Syria, states in his annual report that 109 patients (68 men and 41 women) were admitted to the hospital during the year. Thirty-five were discharged cured, 14 improved, 16 did not improve, 8 patients were found to be not insane, and 12 deaths occurred. At the end of March there remained in hospital 85 patients, an increase of 24 over the figures for last year. Recently there has been an increase in the number of acute cases, many of which were soldiers sent by the French military authorities, and in these the results of treatment have been gratifying. The general health of the hospital, Dr. Smith reports, is good, and there is a fairly good supply of food and medicines, but after the war period much is needed for the general improvement and repair of the institution. The London offices of the Lebanon Hospital are at 35, Queen Victoria-street, E.C.

RATS IN HOUSES: SOUTHWICK v. STANTON.

IN an action in the county court a plaintiff claimed damages, alleging a breach by the defendant of an implied condition under the Housing of the Working Classes Act, 1890, and the Housing, Town Planning, &c., Act, 1909, that a house let to him by the defendant was reasonably fit for human habitation. It was alleged that the house was overrun by rats from a neighbouring sewer, which destroyed clothing belonging to the plaintiff, as well as provisions kept by him in a small room, which he used as a shop. The county court judge found as a fact that the house was, owing to the continuous presence of rats, unfit for habitation, and following the old case of Campbell *v.* Wenlock, a case of a house infested by bugs, that the implied condition applied to the whole house, and that there had been a breach of it if any of the rooms were unfit for habitation. The divisional court held that the county court judge was wrong, and that an incursion by rats did not constitute a breach of the defendant's contract under the Housing, Town Planning, &c., Act. The appeal raised points as to the rats having invaded the house from adjoining premises, and not being continuously there, and also as to the use as a shop of the part which they entered. There was another question also as to the extent of the remedy if the house were to be held unfit for habitation. The case, therefore, does not appear to go so far as to say that the presence of rats cannot make a house unfit for human habitation. Apparently, however, their presence must be continuous, and must make itself felt in rooms used for human habitation and not merely as store-rooms or for trade. Rats are more likely to be found as visitors than as continuous inhabitants of any house, but that their presence is highly undesirable from a sanitary point of view there can be no question. Their habits and the various methods for dealing with them are described in a convenient form in Dr. W. J. Howarth's "Report on Rat Repression in the City," commented on in THE LANCET of June 26th, p. 1374.

J. R. (Crawley).—We are afraid the case you mention is of no pathological interest.

M. F.—The Swiss Passport Office is now conveniently situated for doctors at No. 10, Upper Wimpole-street, London, W.1.

The Relation OF PRELIMINARY SCIENCE TEACHING TO PATHOLOGY.

An Address introductory to the Discussion on Medical Education at the Annual Meeting of the British Medical Association. Delivered on July 1st.

BY J. LORRAIN SMITH, M.A., M.D. EDIN., F.R.S.,
PROFESSOR OF PATHOLOGY, UNIVERSITY OF EDINBURGH.

MR. PRESIDENT AND GENTLEMEN,—The relation of the training in preliminary science to that required in pathology in the medical curriculum is of interest because pathology is in many respects a bridge between the earlier and the later stages. Pathology is anatomical and physiological; it deals with structure and function; in its purview the whole field of abnormalities is included. Without physics and chemistry the development of pathology would be practically impossible. To them the pathologist must resort when he would obtain conceptions and methods for the accurate measurement of living processes. To measure chemical or physical change in the organism is the first step towards a scientific interpretation of the living process.

The student who would become trained in pathology must therefore have a complete knowledge of the elementary principles of physics and chemistry. These sciences serve as an introduction to the whole curriculum, and the courses in these subjects should familiarise the student with fundamental laws and principles on which the whole structure of experimental science is built. The subjects which are taken up during the preliminary period are the foundation for all the later work. It is hopeless to escape from empiricism in medical teaching and practice if we do not take the precaution of beginning the course by a study of physics and chemistry. In the demand for a clear and sufficient introduction to fundamental scientific ideas pathology merely emphasises the claim which is made by all other branches of medicine.

INSTRUCTION IN CHEMISTRY.

The courses in chemistry and physics may well be overtaken to some extent at school, and therefore prior to the medical curriculum. But however we may deal with the general elementary introduction to science, there must remain in the curriculum the chemistry and physics which have direct relation to medicine. This form of chemistry and physics cannot be described as preliminary science. It is the detailed and special study of chemical and physical changes in the substances which are found in relation to metabolism. Physiology, pathology, pharmacology, medicine—each and all constantly require on the part of the student detailed knowledge of the intimate chemistry of metabolism.

Hitherto it has been the practice of the medical schools to include in the courses of physiology, pathology, &c., the chemical instruction required by the particular subject. Recently, however, the plan has been introduced in various schools of giving courses in biochemistry which deal with these problems from the point of view of the chemist. Such courses are valued especially because they give instruction in these metabolic processes in their relation to general chemistry. This the biochemist can teach with a freedom and impressiveness which are of great value in conveying knowledge to the student, and the task of giving instruction of this type is handed over to the biochemist by his grateful colleagues. It is true that it is not the chemical process in itself that is the chief interest to the student of medicine, but the chemical process in relation to the activity of the organ concerned in its production. To take an example: the relation to each other of the various substances which appear in the breaking down of molecules of fat is at the same time a chemical problem and a problem in the physiology of nutrition. Chemical knowledge of the process is the basis on which the study of the process of nutrition rests. It is, therefore, a natural and appropriate subject for the chemical course, and yet it is doubtful if it can be successfully taught in the preliminary period of the curriculum. It is better that the problems of physiological and pathological chemistry should be taught in relation to the courses of physiology and pathology. It is difficult for the student to realise the bearing of the chemical teaching until he has become familiar with the process in the body, for the understanding of which such knowledge is required. To study the process and its chemistry together is the ideal which we should attempt to reach. Hence we should continue the study of chemistry throughout the curriculum. It should at the beginning have place as a preliminary science, but it should continue to be studied in the later years in its application to the interpretation of normal and abnormal organic processes.

How much chemistry should be taught is a question naturally raised at this point. The end to be kept in view is defined by what I have already said. The chemistry of the introductory period, inorganic and organic, must be continuous with and preparatory to all that is required later to understand the teaching of the biochemist when he deals with the chemical changes in metabolism. It would indeed seem natural, therefore, that the direction of the whole teaching should be in the hands of the biochemist. He should begin in the first year by supplementing, if necessary, the general chemical teaching which the students have received at school, and he should extend the work into the sections of organic chemistry and biochemistry which deal with the physiology and pathology of metabolism. It will be necessary for a chemist with such wide responsibility to continue his teaching through several, and possibly through all, the five years of the curriculum. By the unity and continuity of chemical study which would be secured by such an arrangement the student would acquire at each stage the capacity to apply chemical methods of study and interpretation.

THE TEACHING OF PHYSICS AND BIOLOGY.

A similar arrangement would form an equally appropriate method in the instruction to be given in physics. The argument need not be repeated in detail. An introduction to general elementary physics should be given, and this may be obtained wholly or partly in school before entry on the medical curriculum. As the curriculum proceeds in physiology, pathology, general surgery, the special surgery of the eye, the ear, the application of physical methods in medicine, there arises the necessity for special teaching in light, sound, electricity, heat, X rays, radio-activity, &c. As in the case of chemistry, the teaching of physics in relation to the organism is of interest to the student of medicine primarily because of the organic process with which the physical change is associated; but just as we do not propose to leave the teaching of biochemistry to the physiologist, pathologist, physician, and surgeon, so we should commit the teaching of physics to a biophysicist. Unity and continuity is required as in chemistry. In neither case should there be by this arrangement any additional burden placed on the student. The greatest burden which is put upon him by the present curriculum is that of useless knowledge. Time is wasted if spent on studies the interest of which is allowed to lapse at the end of a particular course or after passing a particular examination. The extended teaching which I have proposed would go far to prevent the neglect of the fundamental sciences which takes place under the more haphazard arrangements now in existence. The teachers responsible for the whole course would easily realise what is required at each stage of the curriculum.

The same argument applies, and with still more force, to the study of biology. Pathology, like other branches of medicine, is a form of applied biology. We are too apt to think of animal biology in a restricted sense, as the science of the normal organism. The science has developed its teaching chiefly in the form of morphological description of structure. It is the anatomical or morphological comparison of various types of animal structure that has constituted a large part of the

teaching of animal biology. This forms the introduction to animal biology for the medical student. The normal human organism is studied in detail in the courses of human anatomy and physiology, and it is on a basis of the knowledge gathered in these three courses that the student begins his study of pathology.

STRUCTURAL AND FUNCTIONAL DEVELOPMENT.

In the study of disease the student has to learn the meaning of abnormal structure and function, and in this he has to work out conceptions which the study of the normal may not have brought into prominence. The development of the organism is studied in normal embryology; but in pathology this becomes the basis and the exposition of congenital disease and maldevelopment. To work out the meaning of maldevelopment we have to make use of the laws of heredity and the transmission of structural or functional characters from parent to offspring, and behind the history of the organism and the history of its structural and functional inheritance lies the problem of growth—the nature of growth and the regulation of it as it is seen in cell growth, organ growth, the growth of the body as a whole. In pathological processes in the body growth is disturbed. Sometimes it is diminished, at other times it is excessive; often the growth which results from pathological conditions is partly beneficial and partly harmful. We have to deal with growth associated with pathological irritants; growth associated with hypertrophy in gland or muscle where there is call for increased work; growth which is of the nature of tumour and which assumes a variety of uncontrolled forms partaking of malignancy and revealing absence of the ordinary regulative factors. Disease may be said in general to lead to destruction and disorganisation of the tissues which it attacks. The disorganisation may be followed by recovery in the stages of which the disturbed structure is reorganised or restored more or less completely. To follow the process of destruction or recovery much important study must be directed to the nexus of the various organs with each other in the unity of life.

The margin of function and structure which each organ provides beyond that which is demanded by the bare necessity of bodily activity provides the field within which disease works. When this margin is cut down a point is reached at which the liver or the kidney or the lung or some other organ becomes inadequate. To interpret the functional value of diseased organs requires constant reference to the structural and functional development of the body. Pathological problems are, in a sense, highly specialised, but again we can escape from empiricism in dealing with them only when we give them shape by relating them to general biology and the general study of the development and organisation of the body, and of the origin and correlation of the various organs of which the body is composed. Pathology will be strengthened and simplified in its teaching if the biologist who gave the students their introduction to the general science also continues the teaching in relation to fundamental problems of pathology.

CONCLUSION.

In general my plea is that the present curriculum is wasteful of the students' time because it gives what may be called a general introduction to the sciences, but leaves it to the later teachers or the students themseves to apply the principles and methods of these sciences in the various branches of medicine; whereas a continuity of teaching would concentrate intellectual effort and would thereby attain with much more certainty the standard of work which the curriculum is designed to reach. We must also remember that the student of medicine should be trained in criticism, and for this all-important part of his training the earlier sciences must assume a considerable part of the responsibility. To be a good practitioner of medicine requires that the doctor must possess not only technical knowledge and skill, but also a broad, sympathetic, tolerant conception of life. To secure this nothing could be better than critical reflection on the fundamental conceptions by which the phenomena of life are interpreted.

Medical Experiences IN MACEDONIA AND THE CAUCASUS.

A Lecture delivered before a meeting of the Royal Society of Medicine

BY ARTHUR G. PHEAR, C.B., M.D. CANTAB., F.R.C.P. LOND.,

PHYSICIAN TO THE ROYAL FREE HOSPITAL; LATE CONSULTING PHYSICIAN TO THE BRITISH SALONIKA FORCE AND THE ARMY OF THE BLACK SEA.

MR. PRESIDENT AND GENTLEMEN,—In no other war area can there have been greater wealth of clinical material from the physician's point of view than in Macedonia and the Caucasus, and in this lecture I shall endeavour to give an account of some aspects of the medical work, which was throughout of absorbing interest. The only drawback was the difficulty, owing to stress of work, of making continued observations on a systematic basis, and I must ask the indulgence of the Society for the fragmentary nature of the records in many of the cases I shall have occasion to quote.

HOSPITAL ACCOMMODATION AT THE BASE.

The accommodation in the base area for British sick during the summer of 1918 comprised 15 general hospitals, most of them containing 1560 beds, a few with 2000 beds. In the preceding summer the number of hospitals was nearly as large, additional hospitals having been provided when it became necessary, owing to the difficulties of sea-communication, to modify the policy of evacuation on a large scale to Malta. The large number of beds thus provided was none too great, and often patients had to be discharged to convalescent depôt earlier than one would have wished in order to maintain the necessary reserve of empty beds for fresh convoys.

The hospitals and convalescent depôts were situated away from the town, by the sea or among the hills, in comparatively healthy surroundings. A group of four hospitals, three of which were hutted, were placed at Kalamaria, on a low promontory about 8 kilometres from "Piccadilly Circus," the centre in Salonika, to which all roads converged. One of these hospitals occupied an ideal position overlooking the sea, with an uninterrupted view across the bay to Mount Olympus in the distance, and even on the hottest day relief was afforded by a fresh breeze from the sea, which made its appearance in the early afternoon with unfailing regularity. Here was the section for cases of tuberculosis, which, as a rule, did very well, and one often regretted the necessity of evacuating these cases, in order to provide much needed beds, to less favourable surroundings in Malta or at home. Adjoining this, and on an equally good site, was one of the two hospitals for sick sisters. Another group of hospitals and convalescent depôts was situated high up among the hills, about 16 kilos. from the town, on the plateau immediately below Mount Kotos, a well-wooded mountain of some 4000 feet, which dominated the Salonika district. A couple of hospitals were placed further away across the bay to the south of Salonika, on the promontory of Karabaroun, with communication by water. This was, perhaps, the healthiest of all the sites, as the promontory was swept by sea breezes, the only drawbacks being the complete absence of natural shade and a certain brackishness of the water, which had the effect on newcomers of a mild saline aperient. There was excellent sea-bathing for convalescents, and, in addition to the hospitals, the colony included two C.D.'s and a rest camp. It was necessary to close these hospitals during the winter, owing to their exposed position and difficulties of communication in stormy weather.

Supplementary to the British hospitals there were four general hospitals for Serbs, staffed entirely by British personnel, two of which were near Salonika and two at Vertekop, about two and a half hours' run on the Monastir road, not far from the Serbian front. The fortnightly visits to Vertekop were always interesting, as, owing to temperament or circumstances, or both, the resisting powers of the Serb to disease were on a different level from those of the British, and common diseases frequently presented unusual features; also, one saw examples of conditions, such as scurvy, that were practically unknown among our own troops. The most attractive medical unit in the command was at Stavros, a four hours' journey to the east, on the shores of a sheltered bay with high-wooded mountains rising steeply behind. The tents were pitched by the seashore,

and between them were well-grown plane trees which gave good shade; the water-supply was abundant, and on the fertile soil all kinds of produce were grown for hospital consumption; it was curious that a well-wooded site like this should be practically free from anopheline mosquitoes. Though nominally a field ambulance, the unit was practically on the scale of a stationary hospital. Closely rivalling Stavros in natural beauties was a unit in the opposite direction at Naoussa, beyond Vertekop, where a C.D. was established in connexion with the Serbian hospitals, high up among beech forests on the slope of a mountain which arose behind the depôt to a height of over 6000 feet. Unfortunately, this was too far away to be used to any large extent by the British, though accommodation was unofficially available for a limited number of officers, and was much appreciated by those who were run down and in need of a holiday.

The Climate of Salonika.

Much has been said in disparagement of the climate at Salonika, but, with all its drawbacks, we might in many respects have been worse off. The heat in the summer was sometimes very trying, especially for those who had to reside in Salonika itself; the hills, which during spring and early summer were covered with a profusion of flowers, towards the end of June became parched and arid and of a monotonous faded yellow aspect, all vegetation being dried up with the exception of patches of the dwarf prickly oak. But, outside the town, the days were few when the heat did not become mitigated in the afternoon by the breeze from the sea, and the nights were usually tolerable. The winter climate was of two kinds—periods of three to five days during which the bitter "Vardar" wind blew from the snow-covered mountains to the north, bringing with it cold rain and a state of indescribable mud, or blizzards of fine driven snow with 20° or more of frost. During these spells transport was a matter of the greatest difficulty, and there was nothing in the climatic conditions to make life attractive except the certain knowledge that in the course of a few days matters would improve, and two or three weeks would follow of perfect weather, practically windless, with cold nights and warm days, when convalescent patients could sit out and enjoy the sunshine.

MALARIA.

The rôle played by the mosquito in shaping the destinies of the British Salonika Force may be partly realised from the fact that the total admissions to hospitals for malaria during the years 1916, '17, and '18 amounted to 161,560. Expressed as a ratio per 1000 troops, this number is equivalent to 1053 per 1000, the ratios for the respective years being: for 1916, 331 per 1000; 1917, 353 per 1000; 1918, 369 per 1000. These figures, large as they are, do not represent the whole incidence of malaria, since they include only admissions to general hospitals, stationary hospitals, and C.C.S.'s. They do not include cases treated at field ambulances and discharged as fit from there, nor cases returning to duty after treatment by regimental M.O.'s, nor do they take into account the numerous instances in which

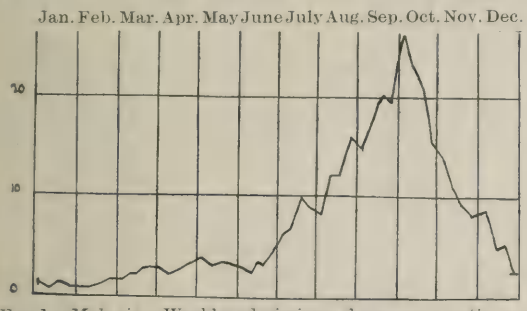

FIG. 1.—*Malaria.*—Weekly admissions shown as a ratio per 1000 troops during the year ending Dec. 31st, 1917.

officers and men with slight attacks carried on without reporting sick. The mortality was at the rate of 2·02 per 1000 troops during 1916, 1·17 per 1000 during 1917, and 1·69 per 1000 during 1918. The last figure is probably too high, as there was an enormous increase in the number of reported deaths from malaria in the earlier part of the influenza epidemic, and the figures undoubtedly include many cases in which death was due, not to malaria, but to influenza or its complications.

The seasonal incidence of the disease is well shown by the accompanying curve (Fig. 1), which is based on the return of weekly admissions during 1917, shown as a ratio per 1000 of strength. It is seen that the first material increase in the number under treatment, representing the earliest fresh infections of the year, was at the end of June, from which date there was a steady rise to a maximum in the beginning of October, followed by an abrupt fall during the latter part of that month and continued through November. The cases responsible for the early part of the flow of the malarial tide are exclusively benign tertian. This is probably due to the fact that subtertian infections die out in the course of the winter, and that from February onwards relapses are generally attributable to the more resistant B.T. parasite. The B.T. relapsing cases act as carriers, from which the mosquitoes become infected as their activity increases in early summer. About the latter part of August the number begins to be appreciably swelled by the inclusion of malignant tertian cases. Coincident with this is a distinct change in clinical type; the severity both of B.T. and M.T. cases is greater, cerebral cases become more frequent, and the death-rate rises. It has been impossible to determine the exact ratio of B.T. to M.T. cases, as such a comparison could only be effected by a complete series of blood examinations: the amount of pathological work entailed by this procedure would have been overwhelming, and in 1917 an order was made that in cases where the diagnosis was clear on clinical grounds blood films were not to be sent to the laboratories. Sufficient data are, however, available to show that the incidence of benign tertian malaria was at its highest in the course of September, and that malignant tertian malaria attained its maximum about four weeks later, by which time there had been a considerable fall in the number of B.T. cases. During the early part of the malarial season the prevailing species of mosquito is *Anopheles maculipennis*. With the appearance of M.T. malaria in August the mosquito ranks are swelled by the addition in large numbers of *Anopheles superpictus*. It might be supposed that there is some causal connexion between the two events, but I am told by Colonel Wenyon that there is no direct evidence that *A. superpictus* possesses any superiority over *A. maculipennis* as a carrier of M.T. infection; both species appear to infect themselves equally readily with M.T. parasites.

Clinical Features.

In attacks of primary B.T. malaria the clinical phenomena usually formed so definite and characteristic a picture as to be recognisable even by those who had had no previous practical knowledge of the disease. But the same cannot be said of the manifestations of subtertian and recurrent malaria, and a very short experience in Macedonia sufficed to bring home the difficulties with which diagnosis might be beset.

In malaria the parasitic invasion, which is a general one, often falls with disproportionate emphasis on some special tissue or organ, thereby producing a symptom-complex which may lead to a remarkable simulation of other forms of disease. Thus cases were admitted with symptoms of an acute enteritis, with frequent watery stools, sometimes fæculent, sometimes containing blood and mucus. The clinical resemblance to dysentery might be very close, but no dysenteric organisms were present, and in many cases an examination of the blood disclosed evidence of malaria. The condition yielded rapidly to prompt treatment with quinine, and there is every reason for regarding these as cases of malarial enteritis. In other cases the intestinal symptoms were more severe, the stools being profuse and watery and associated with vomiting, collapse, and cramps, simulating cholera. Other cases were seen of prolonged pyrexia of indeterminate type, in which one or another member of the enteric group was suspected, and it was only after weeks of illness and repeated blood examinations that the nature of the case could be proved by the demonstration of parasites in the peripheral circulation.

Difficulties in Diagnosis.

A mistake made by almost everyone at some stage of his experience was the diagnosis of appendicitis in cases of malaria where initial symptoms of marked pain and tenderness with muscle rigidity in the right iliac region were prominent, and in some of these instances an opportunity was provided by the surgeon of proving, by direct observation, the healthy character of the appendix. The absence of anything like a definite tumour, and the results of blood examination, including differential count of leucocytes, were

the distinguishing criteria in these cases, though it must be allowed that, exceptionally, the simulation of appendicitis was so close that the matter could only be decided by an exploratory laparotomy. Further pitfalls for the unwary were provided by cases of malaria with lumbar pain and a transient hæmaturia, rapidly subsiding under quinine; cases with symptoms of acute nephritis also rapidly controlled by quinine; cases with acute gastric symptoms and hæmatemesis; cases of acute pleurisy with effusion, the fluid sometimes containing blood; cases with acute pulmonary symptoms, cough and copious purulent sputum, often streaked with bright red blood and signs of a patchy consolidation of the lung; cases with acute mental symptoms; cases with coma of abrupt onset, resembling apoplexy; cases with epileptiform fits, or symptoms suggesting a cerebellar or a bulbar lesion; cases simulating meningitis with prostrating headache, head retraction, and rigidity of neck muscles; in an example of this, occurring on a hospital ship and diagnosed as a fulminant form of cerebro-spinal fever, the blood examination showed a heavy infection with B.T. parasites.

It is not intended to discuss the exact pathology of these conditions, nor to make any attempt to define the extent to which the symptoms in some instances may be due to a complication of the initial malarial invasion by an added bacterial infection. What I wish to emphasise is the importance in the first place of not overlooking the malarial factor; and secondly, of giving due weight to this factor in determining the treatment to be adopted.[1]

With a widening realisation of the manifold and far-reaching activities of the malaria parasite, there arose an almost inevitable tendency on the part of the clinician to fall into a different error, and, attaching undue weight to probabilities, to arrive too readily at a diagnosis of malaria in doubtful cases. Such diverse post-mortem conditions as cerebral abscess, meningitis, hepatic abscess, gastric ulcer with perforation, appendicitis, were found in cases diagnosed as malaria. These mistakes were sometimes due to lack of thorough examination, and therefore unjustifiable; but, on the whole, it is remarkable that the standard of diagnosis was so high, and serious mistakes were so infrequent, considering the strenuous conditions of work in the hot season when hospitals were crowded and heavy convoys were coming in at short intervals, and bearing in mind that of medical officers arriving in the country there were very few indeed who had any previous experience of tropical diseases.

The difficulties of diagnosis were enhanced in the influenza epidemic when the two infections frequently ran concurrently in the same individual; and the clinical threads became still more tangled when, as happened at one time, a considerable outbreak of sandfly fever was added to the prevailing epidemics of malaria and influenza. There were many difficult cases in which the only proof of malaria lay in the demonstration of the parasite in the blood. An ideal course would have been the examination of a blood film in every case; but with such large numbers this procedure was impossible; and in order to relieve laboratories of unnecessary strain it was ruled that blood films were not to be taken in straightforward cases progressing favourably under quinine treatment. The information afforded by examination of the blood was especially useful in the more chronic forms of malaria with irregular pyrexia, in which there might be long periods without demonstrable parasites in the peripheral blood. The diagnosis in these cases was often proved by repeated blood examinations, resulting sooner or later in a positive finding. In the apyrexial stage the information afforded by a white blood corpuscle count was always valuable, as the combined relative preponderance of large mononuclear cells, with reduction in the total number of white cells, gave a picture which was the reverse of that obtaining in many of the acute inflammatory conditions from which malaria had to be distinguished. Enlargement of the spleen taken by itself was of little help; but a palpable and tender spleen, or tenderness over the splenic area combined with increase upwards of the splenic dullness, was valuable evidence of acute malaria.

After-effects of Malaria.

The after-effects of malaria were numerous, and examples were commonly to be seen not only in the wards of general hospitals but also in the various special departments of the medical service. In the cardiological department a large proportion of the cases of D.A.H. with unduly sensitive exercise-response were traceable to malaria. In the neurological department, in addition to cases of peripheral or central lesions of the nervous system directly due to malaria, the influence of the disease as a contributory factor in various functional conditions was clearly manifested. In the mental department a majority of the cases under treatment was attributable to the same cause. In an analysis published in THE LANCET of Jan. 3rd by Major A. T. W. Forrester, R.A.M.C., who was latterly in charge of the department, it appears that the commonest type of psychosis following malaria was either some form of mental confusion or depression. The outlook in these, as in other post-malarial psychoses, is favourable, and after a course of treatment it was generally found possible to transfer cases to the general wards, whence they could be sent home by hospital ship as ordinary patients.

No one passing through the malaria wards of any general hospital could fail to be impressed by the large proportion of cachectic cases, with profound anæmia, enlarged spleen, marked wasting, more or less pyrexia, and persistent tachycardia increased on any slight exertion. Very low blood counts were recorded—e.g., 900,000, 880,000, 810,000, and in one case 690,000. Accurate hæmoglobin estimations were unfortunately seldom available, as many of the instruments had deteriorated through climatic influences, and the colour readings were not reliable. In some instances the blood picture was of the "pernicious" type, with poikilocytosis, megaloblasts, and a high colour-index. In others the clinical picture was that of pernicious anæmia, + a large spleen, + myelocytes in the blood. In other cases there was an aplastic anæmia with little or no attempt at repair. In two cases at least blood was transfused. One of these, a patient with M.T. malaria and profound anæmia, under the care of Major A. C. Sturrock, R.A.M.C., was transfused twice, 18 ounces of blood being introduced on the first occasion, 24 ounces on the second. Previous to transfusion the patient was going rapidly downhill, and it seemed that a fatal issue could not long be delayed. The immediate effect of the first transfusion was very striking, but it led to no permanent response on the part of the blood-forming tissues, and again the patient lost ground, and a fortnight later was rapidly approaching his former condition. The second transfusion was followed after a short interval by a gradual and lasting improvement in the blood state, the first evidence of returning functional activity being a remarkable increase in the white corpuscle count from 3200 to 12,300, this leucocytic phase definitely preceding the period of red cell reconstruction. The patient was evacuated by hospital ship three months after his first transfusion. A full account of this interesting case will be duly published by Major Sturrock, who has kindly supplied me with the above details.

Treatment.

I do not propose to spend time in describing the routine measures of treatment which came to be adopted as the result of our experience of malaria in Macedonia. I have dealt with these in some detail in a recent article in THE LANCET (Jan. 24th, 1920), and will here limit my remarks to the discussion of certain points of general interest.

In endeavouring to estimate the value of quinine in the treatment of malaria one is at once impressed by the remarkable contrast between its controlling influence over the acuter manifestations and its comparative failure to prevent relapses in the more chronic forms. In acute malaria the results obtained by quinine properly administered and in sufficient quantities are little short of marvellous. As our experience grew the tendency was to give increasingly large doses in primary attacks, as it was found that this was the only stage of the disease at which permanent results in the sense of preventing relapses could be hoped for. In cerebral malaria the prompt use of intravenous quinine undoubtedly saved many lives. But as a means of controlling the incidence of relapses in recurrent malaria the efficiency of quinine was found to be on a very different plane. Numerous observations were made, some on a considerable scale, having for their object the comparison of large bodies of men; others in special malaria wards, where, with comparatively small numbers to deal with, it was possible to carry out a systematic comparison of various methods on a scientific basis. The practical outcome of an immense amount of work was the realisation of the impossibility of eradicating the malarial parasite from the system in cases of relapsing malaria by any method of treatment. While quinine was being taken in effective doses the disease was kept more or less under control, but on the cessation of treatment relapses again made their appearance, and after a few weeks became as frequent as in the period before the treatment was begun. The best results in relapse-control were obtained

[1] Lieutenant-Colonel A. W. Falconer, R.A.M.C., in an article on The Pulmonary Manifestations of Malaria, in the Journal of the Royal Army Medical Corps, February, 1920, describes a group of cases presenting the physical signs of more or less extensive consolidation of one or more lobes. He considers that in most of these cases the physical signs depend on massive collapse and not on true consolidation, and regards the condition as representing a pure malarial phenomenon. I was unfortunate in seeing very few cases in which the physical signs could be interpreted as due to pulmonary collapse, and formed the opinion that the most common pulmonary complication of malaria was a fine-tube bronchitis, with patchy consolidation of one or both lungs, probably due in all cases to a superadded infection.

in the special observation wards, under the direction of Major A. G. Anderson, R.A.M.C., by the "week-end" system of 30 gr. of quinine on each of two successive days in each week; an important advantage of the method is that treatment can be continued for an indefinite period. Under this system the percentage of non-relapsing cases was raised to 78, as compared with 32 per cent. in cases in which no quinine was given except for the treatment of relapses as they occurred. But for all its limitations no drug was found to exceed, or even to approach, quinine in efficiency. At one time with the introduction of galyl it was hoped that a parasite destroyer of considerable power had been discovered, but the promise of early trials was not fulfilled, and although the preparation undoubtedly possesses some parasite-destroying properties, specially in subtertian cases in which quinine has been pushed to the limits of tolerance, its chief value was found to lie in stimulating the blood-forming organs in cases of profound cachexia and in the anæmia of blackwater fever.

Methods of Administration of Quinine.

On the much-debated subject of the channel by which quinine may with the greatest advantage be introduced, a very decided impression was formed that a given quantity of quinine is more effective if injected intramuscularly than if taken by the mouth. It is difficult to say how far this impression was correct; observations made in the Special Malaria Laboratory on the rapidity with which parasites disappear from the blood and the rate of quinine excretion suggests that the advantage lies with oral quinine. Personally I hold the view that if the desired effect can be obtained by oral quinine there is no justification in submitting the patient to the inconvenience of intramuscular injections. But instances in which quinine requirements could not be met by the oral method were very numerous, and the value of the alternative channel was amply proved in such conditions as vomiting or intestinal disturbance, when absorption from the alimentary tract is impaired, and in cases of pernicious type, where it is imperative to produce a greater effect than can be obtained by mouth administration only, and in cases of cerebral malaria as a supplementary measure to intravenous injections. The risk of local complications is practically negligible if ordinary precautions are taken to prevent such mishaps as sepsis and injury to nerve-trunks. In a recent number of the *Journal of Hygiene* (October, 1919), Colonel L. S. Dudgeon has drawn attention to the serious degree of necrosis which follows intramuscular injections of quinine in mules and rabbits, and has suggested that medical officers and officers in charge of divisions in the Salonika hospitals were not fully alive to the injuries they might inflict on their patients. It may be said that, apart from cases of faulty technique, and a few instances of extensive necrosis that followed intramuscular injections in patients who were debilitated from the effects of dysentery, such untoward results were practically unknown in our clinical experience. The number of injections given was enormous, and there is no means of accurately estimating them; but assuming that each of 12 medical officers in each general hospital had occasion to give one intramuscular injection on each day during the malarial season of, say, 100 days—an assumption which is undoubtedly considerably below the mark—the total number of injections for the season would amount to 18,000, and yet with the exceptions mentioned above, it was the rarest event for any ill-effect to follow beyond a localised induration which rapidly subsided, leaving no permanent disability.

The treatment of malaria in patients who at the same time were suffering from dysentery presented special difficulties, as on the one hand oral quinine was badly absorbed and often of little use, and on the other hand there was the risk of intramuscular injections, if repeated, leading to serious damage to the muscle. With this combination of diseases it it was often impossible to push quinine to the same extent as in a case of uncomplicated malaria. Many of the acute Shiga cases showed a marked febrile reaction, and in order to assess the pyrexia at its true value, the examination of blood films was found to be quite as important, if not more so, in the dysentery hospitals as in any other.

Symptoms Resulting from Administration of Large Doses of Quinine.

Of unfavourable symptoms as the result of the large doses of quinine which it was often necessary to give we had fortunately small experience. A few cases of idiosyncrasy were seen in which a moderate or even a small dose of quinine consistently gave rise to hæmoglobinuria. An instance of this was met with in a Greek boy, who had had malaria and was given a dose of quinine, with resulting hæmoglobinuria and the rapid development of a very marked anæmia. It was thought the matter might be a coincidence, and as there were special reasons for quinine treatment a further dose of 10 gr. was given after a short interval with the same dramatic result of an intense hæmolysis and severe anæmia. This condition should be sharply differentiated from blackwater fever, which I believe comes and goes quite independently of quinine. A variety of skin lesions, such as erythema, scarlatiniform rashes, urticaria, and less commonly purpura occurred in definite association with quinine treatment. More serious than these was a condition of exfoliative dermatitis, of which I saw two examples. In each there was a protracted illness, in the course of which the exfoliative condition became generalised, and ultimately septic infection occurred, notwithstanding the most careful nursing, and the patient succumbed. The total duration of illness in one of these cases was six months.

In the course of 1917 12 cases of quinine amblyopia were reported. Further cases occurred in 1918, but I do not know the exact numbers; they were fewer than in the previous years. Of the 1917 cases, two followed the taking by mistake of a large but unknown quantity of quinine; in one two "mouthfuls," in the other four to six tablespoonfuls of quinine in solution were taken. The remainder were cases of severe malaria in which the need for pushing quinine in large doses was imperative. Most of these were cases of subtertian infection; in three the clinical condition was complicated by blackwater fever.

One patient, an officer, while on 30 gr. daily, developed cerebral symptoms and was given while unconscious 70 gr. of quinine intravenously and 90 gr. intramuscularly, 160 gr. in all. On regaining consciousness he was amblyopic. There was a gradual but slow return of vision, and when evacuated by hospital ship several weeks later there was still a considerable degree of amblyopia. Another case, of M.T. malaria with multiple rings, was given on Oct. 14th 30 gr. of quinine intramuscularly; on Oct. 15th 60 gr., half intramuscularly, half by mouth; and on Oct. 16th 60 gr. intramuscularly. After the evening dose he could hardly see, but the pupils reacted well to light. At 8 A.M. on Oct. 17th he was totally blind with widely dilated pupils which did not react to light. In the evening he could see a little. On Oct. 18th he was delirious, but apparently could see. On the next day his malarial symptoms were so urgent that it was decided after careful consideration to give more quinine, and 15 gr. were administered intramuscularly. After the injection there was rapid dilatation of the pupils and he became totally blind with pallor of the discs and contraction of the retinal arteries to a mere thread. On the following day he was given galyl, but in the evening the general condition was so grave that it was decided that further quinine treatment was imperative, since it afforded the only hope of saving his life, and that it must be undertaken even at the risk of permanent damage to the sight. Further doses of intravenous quinine were given, but the treatment was unavailing and the patient died.

In a third case of cerebral malaria 55 gr. of quinine were given on Nov. 21st, 60 gr. on the 22nd, and 20 gr. on the 23rd. He then became completely blind, and when I saw him a few hours later the pupils were widely dilated, failed to react, and the fundus was pale with very small thread-like arteries. No further quinine was given after the onset of blindness, but notwithstanding this there was not the slightest recovery of vision, and the patient was evacuated by hospital ship several weeks later, still blind. In this case continuous sluggish movements of the iris were observed independently of light stimulus.

These cases fall into three groups: (1) Those in which there is fleeting amblyopia followed by full recovery of vision; (2) cases of incomplete recovery in which useful vision is restored but with a varying degree of lasting contraction of the fields; (3) a comparatively small group in which blindness is permanent.

The Y Scheme.

Owing to increased submarine activity in the first half of 1917, facilities for invaliding by sea became greatly restricted, and there ensued a gradual accumulation in the Salonika command of men whose usefulness for military purposes was practically nil, since by reason of repeated attacks of malaria they spent the greater part of their time at hospitals and convalescent depôts, in many cases being readmitted from C.D. to hospital for a malaria relapse before their period of convalescence was completed. These men were not only unfitted for active service and an unnecessary burden on the military machine, but as possible carriers they constituted an actual danger to the community. On the other hand, there was a fair prospect that under less trying climatic conditions a proportion of them would recover to a sufficient extent to be of use in the home command or in France. These circumstances led to the inception and organisation of the Y scheme, and by the latter part of December, 1917, the necessary arrangements had been completed and the first drafts were evacuated from Salonika under the scheme. The men were chosen with the greatest care, every case being inspected either by the D.M.S. or the consulting physician before being passed as suitable for evacuation. The scheme worked well, and by Oct. 31st, 1918, a total number of 26,001 officers and other ranks had been evacuated, to the great advantage both of the command as a whole and of the men themselves. I am told that these officers and men, not only useless but a danger to their companions in the East, have in a large proportion of cases regained their health and strength, and have been responsible for much good work both at home and on the Western front.

Malaria in the Caucasus.

The shifting of the troops after the armistice from Salonika to the neighbourhood of Constantinople and to

the Caucasus was followed by a marked improvement in the health of the army, and at the same time there was a considerable change in the character of the sickness. The dominance of malaria over all other conditions dwindled, and diseases, such as typhus, small-pox, and relapsing fever, of which only occasional isolated cases cropped up in Salonika, made their appearance in increasing numbers during the early spring of 1919. Thanks to protective measures and early isolation of cases, these diseases were always under control, and did not assume anything approaching the dimensions of the epidemics by which large sections of the Turkish and Russian armies were devastated. The approach of the malarial season was awaited with some curiosity, as we were anxious to see how far the prediction of a heavy malarial incidence in this new country would be fulfilled. In June, when I had an opportunity of visiting the medical units in the Caucasus, except for recurrent cases carried over from previous seasons, there was no malaria. My first note of primary malaria was on July 14th, when a man from Batoum, who came out from home in December, 1918, was admitted to a general hospital in Constantinople with a B.T. infection. There may have been a few isolated cases before this, but, in contrast to our experience in Salonika, primary malaria in the early summer in the Caucasus was a negligible quantity. On a subsequent visit in the latter part of August the state of things was very different, and there were serious outbreaks of malaria in many parts of the country. At an aviation post at Petrovsk, on the shores of the Caspian, 50 out of 150 men had gone down in the course of a fortnight. A battalion on its way to Shusha, a post among the hills, had its orders changed while en route, and encamped at Barda on the plain, on a site chosen, among other reasons, for its propinquity to a stream. I was told by the C.O. that no mosquitoes were noticed until about 10 days later, when men began to go down with malaria. I visited the battalion a few weeks later after they had moved to a healthy camp on high ground above Tiflis, and by that time out of a total of 305 N.C.O.'s and men 303 had fallen victims to malaria. A large proportion had been sent into hospital, but fresh relapses were occurring every day, and it was with great difficulty that fatigue parties could be mustered for the performance of the ordinary camp duties. At this period there was a general movement of troops in progress from Baku and Tiflis to the Black Sea coast at Batoum, where malaria was also prevalent, most of the available camping-ground being heavily infested by anopheline mosquitoes.

BLACKWATER FEVER.

During the year ending Oct. 31st, 1918, 136 cases of blackwater fever were reported in the Salonika command, of which 36 died, giving a case-mortality of 26·5 per cent. In the previous year only 18 cases were reported. The circumstances of the two years are not strictly comparable, as in the course of 1916 malaria cases in large numbers were being invalided to Malta, and during the following winter blackwater fever was common in Malta. Owing to submarine risks and consequent restrictions in sea-communication between Salonika and Malta the evacuation of malaria cases on a large scale became for the time impossible, and the accumulation of these cases in Salonika was doubtless largely responsible for the rise in the blackwater figures. The chart (Fig. 2) shows the seasonal incidence of the disease; it is seen that the great majority of cases occurred between December and April, with a maximum in February, and that during the summer there were no cases except for a short outbreak during September. This happened to correspond with the military advance, and is probably related to the strenuous conditions and special hardships of that time. During the winter there were three short spells of exceptionally severe weather. The first of these was in early December, and coincided with the beginning of the blackwater season; the second was in early January; and the third, at the end of March, may have been responsible for checking the fall in the number of blackwater cases that had already taken place. There was no specially severe weather in the last three weeks of January or during February, when blackwater fever attained its maximum incidence.

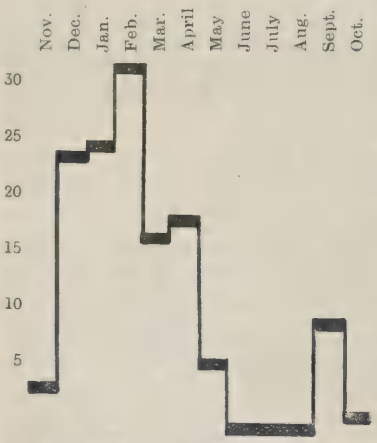

FIG. 2.—*Blackwater fever.*—Number of cases reported monthly during the year ending Oct. 31st, 1918. The heavy lines represent the months as given above.

The Relation of Blackwater Fever to Malaria.

The outstanding feature in the ætiology of blackwater fever is its relation to malaria. Of a series of 78 cases which I had special opportunities of investigating, in all except one a definite history of malaria was obtained, and seeing how prevalent malaria was it is more than probable that this single case was really no exception to the rule that malaria is an invariable antecedent of the condition. But notwithstanding this general relationship, it was rare to find evidence of more than slight malarial activity during the actual blackwater attack. In only 27 per cent. of a series of 58 cases in which special care was given to the examination of the blood were there positive findings, and in nearly all of these the number of parasites present was very small. The type of parasite was B.T. in seven cases, M.T. in four, and indeterminate forms, probably M.T., in five cases. That some agent other than the malarial parasite is the determining factor in the acute hæmolysis of blackwater fever is further suggested by its seasonal incidence, which in Macedonia is at its height not during the malaria season, but at a time of year when malarial activity is at its lowest level. What the determining factor is remains at present obscure. No support was found for the hypothesis that quinine is the activating agent. On the one hand, blackwater occurred in cases in which no quinine had been taken for a considerable period; on the other hand, in several cases quinine was given in large doses without prolonging the period of blackwater; it was the practice of some M.O.'s, in the belief that blackwater fever was the expression of a specially malignant type of malaria, to treat the condition energetically with quinine, and I have many charts which illustrate the rapid and complete clearing of the urine under these conditions.

Clinically the cases presented no special features. The abrupt destruction of enormous numbers of red corpuscles, leading to a drop to 30 per cent., or even 20 per cent., of the normal number; the state of collapse with extreme pallor and small compressible pulse; the rapid darkening of the urine with characteristic absorption bands; the pyrexia with shivering, vomiting, headache, and lumbar pains all went to form a picture which differed in no essential from that described in connexion with outbreaks elsewhere. The average duration of hæmoglobinuria was three days; the longest period was five days; in one case characteristic dark red urine was passed on a single occasion only; all subsequent specimens were clear. Two symptoms we learned to regard as of specially grave significance—jaundice and suppression of urine. Enlargement and tenderness of the liver, with slight icteric staining of the skin, was a common feature of nearly all cases; but deep jaundice was a symptom only of the more serious cases and was nearly always followed by death; in every one of 30 fatal cases there was well-marked jaundice; in 17 of these the icteric staining was intense. In all the fatal cases except two there was either complete suppression of urine or the amount was reduced to a few ounces per diem. In the two exceptions a fair secretion of urine was maintained to the end; in both of these cardiac dilatation with pale and flabby muscle was found post mortem. Suppression was often associated with persistent vomiting and intractable hiccough, causing great distress to the patient and rapidly leading to exhaustion. In some cases hypodermic injections of hyoscine (1/100 gr.) combined with morphia (1/6 gr.) were successful in controlling these symptoms when other means had failed.

Treatment.

The most important measures in treatment were found to be warmth and the introduction of large volumes of fluid either by mouth, rectum, subcutaneously, or in exceptional cases intravenously with the object of diluting toxins and maintaining a free flow through the kidneys. The use of Souttar's apparatus was of great value, as by this means continuous rectal administration of saline can be effected, and as much as 5 or 6 pints introduced in the course of 24 hours. The life of one patient, a nurse, under the care of Major Anderson, was undoubtedly saved this way. The general rule in regard to quinine was to withhold it unless there was

evidence of concurrent active malaria. If parasites were present, or the spleen was enlarged and at the same time tender, quinine was given in full doses and with beneficial results.

DYSENTERY.

Next in numerical frequency to malaria, and hardly less important in its consequences, was dysentery. The total number of admissions for the three years was 21,147, representing a ratio per 1000 troops of 64 in 1916, 29 in 1917, and 58 in 1918. The total number of deaths was 414, equivalent to 1·9 per cent. of admissions; or calculated as a ratio per 1000 troops, 1·4 in 1916, 0·6 in 1917, and 0·98 in 1918. The above figures are probably in excess of the actual numbers, especially for the year 1918, as, owing to the importance of early treatment and the impossibility of bacteriological examination in all cases, it was agreed to accept as the basis of diagnosis clinical criteria irrespective of bacteriological proof. This policy was deliberately adopted as affording the maximum of protection to the community, though it doubtless involved a diagnosis of dysentery in a certain number of cases of acute enteritis which were really due to some other cause.

There are, unfortunately, no figures available to show the relative frequency of the amœbic and bacillary forms of the disease. The latter was the dominant form, and though amœbic cases were present throughout, it was only late in the season of 1917 that the extent to which this form prevailed in the command came to be recognised, partly owing to the indefatigable work of a protozoologist who spent his whole time in visiting laboratories, giving his opinion on doubtful specimens, and advising as to methods. Evidence gradually accumulated of the existence of a widespread amœbic infection in its most insidious form, being carried by apparently healthy individuals, with or without a history of previous dysentery, and often suffering from no disability beyond occasional attacks of diarrhœa. The policy with regard to evacuation of dysentery cases became more and more stringent; first all proved cyst carriers were sent home; then all cases who came under observation with a history of repeated attacks of diarrhœa; then all dysentery cases with a history of a previous attack; and, finally (in 1919) all cases of dysentery, amœbic or bacillary, first attacks or otherwise, clinical or bacteriologically proved, were evacuated by hospital ship. These successive measures indicate the importance which came to be attached to the rôle played by carriers in spreading the disease in both amœbic and bacillary forms. It is impossible to say how far these measures might have succeeded in reducing the disease had troops remained in Salonika during 1919 in the same numbers and under similar conditions; with the rapid evacuation of troops after the armistice and the shifting of headquarters to Constantinople the conditions were radically changed; but it is worth noting that the type of dysentery seen in the hospitals in the Caucasus during 1919 was very different from that we had been familiar with in Salonika; the bulk of the cases were mild and of short duration; serious cases were uncommon, and the death-rate for the year was only 0·43 per 1000 troops.

Of equal importance to human carriers, and commonly forming an intermediate link in the chain of infection, came flies. The plague of flies was at its worst at two periods of the year, in the early summer and in the autumn; at both these seasons the heat was accompanied by a relatively high humidity; during the intervening months of great heat with dryness the fly nuisance was largely mitigated. Turning to the dysentery curve, it is seen to present a precisely similar seasonal variation, with an initial outbreak in the spring, reaching its maximum in late June and July, followed by a substantial reduction in the number of cases during August and September, and a recrudescence of disease in the autumn, at its height at the end of October or early in November. (Fig. 3.) This coincidence, obvious on the larger scale, was worked out on a more exact basis for a group of hospitals near Salonika, by Captain J. F. Taylor, R.A.M.C., whose observations go far to incriminate the fly as a carrier of dysentery organisms. Not only did he establish the fact that in these hospitals the incidence of dysentery corresponded exactly to the prevalence of flies as measured by the numbers caught in traps, which were exposed from 11 A.M. to 2 P.M. on each day, but he also showed

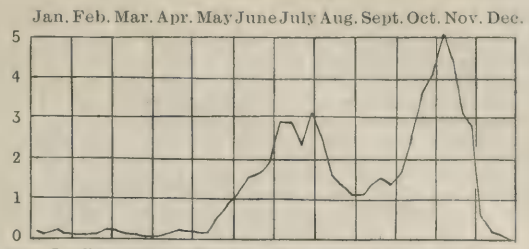

FIG. 3.—*Dysentery.*—Weekly admissions during 1918 shown as ratio per 1000 of strength.

experimentally that the fly is capable of carrying both Flexner and Shiga bacilli; in one instance he recovered from a fly, captured in a hospital kitchen, Shiga bacilli with typical cultural and agglutination characters.

Clinical Features.

As with malaria, so in dysentery, a few cases were seen in which the initial symptoms appeared with such dramatic suddenness, and the intestinal disturbance was of so severe a character, that the possibility of the case being one of cholera could not be dismissed without serious consideration. The possibility of an outbreak of this disease had always to be reckoned with, though fortunately the organisation which had been prepared to meet such a contingency never had to be put to the test. In the cases referred to all the initial symptoms of cholera were present—copious rice-water stools, profuse vomiting of watery fluid, cramps, low blood pressure, and rapid collapse; but an immediate examination of the stools showed an absence of vibrios, and the cases, which ultimately were proved to be dysentery, responded rapidly to intravenous injections of antidysenteric serum combined with hypertonic saline.

Œdema.

Another interesting group of cases was characterised by œdema. This sometimes developed during the acute phase of cases of a severe Shiga infection, in which there appeared to be a rapid flooding of the system with dysentery toxins. In other cases the symptoms appeared at a later stage and in the absence of any of the usual antecedents of œdema. The cardiac condition, though feeble, was not in itself sufficient to cause œdema; the urine was not reduced in quantity, and though containing albumin in varying amounts, it had none of the characters which are usually associated with acute nephritis. The possibility of the condition being due to a food deficiency, and connected with the drastic restrictions in diet which were found essential in the routine treatment of acute dysentery, deserves consideration. A noteworthy feature is that ascites was often a prominent symptom, and out of proportion to the œdema elsewhere; thus in one case ten pints of fluid were removed from the abdomen, and on the following day, when I saw the patient, there was still a large amount of fluid present.

Other cases of special interest were those in which after the cessation of all intestinal symptoms pyrexia continued and the patient rapidly lost ground and became emaciated. The tongue was usually dry, smooth, and shiny. A liberal diet made little or no difference to these patients. They were able to take and digest a considerable amount of semi-solid food without diarrhœa or any symptoms of gastric or intestinal disturbance, but their assimilative powers seemed at fault and they steadily lost weight.

Hæmorrhage and Perforation.

These were both very rare complications. The first event was more common in connexion with the ulceration of long-standing amœbic dysentery than in cases of bacillary origin. In cases of perforation the actual rupture of intestine was almost always preceded by an adhesive peritonitis, which sufficed to prevent a general infection of the peritoneum. The resulting abscess formed slowly and was strictly localised. The whole process was very insidious, and, being marked by no special symptoms either at the time of perforation or during the subsequent stage of pus formation, might easily be overlooked. In one instance of acute Shiga dysentery a generalised acute peritonitis occurred without perforation; except for rather marked meteorism, the features of the case were in no way distinctive, but at the

post-mortem examination general peritonitis was found, with two pints of thin purulent fluid in the abdomen. The intestines were examined with the greatest care, but no perforation was discovered.

Arthritis.

Although arthritis cannot be called a common complication of dysentery, there were during the season always a few cases under treatment, arising more often in complication of Shiga than of Flexner infection. The condition usually appeared in the course of the third week and involved one or more of the larger joints, especially the knee. In the acute stage there was considerable enlargement and tenderness of the joints, with effusion of fluid, and pyrexia of irregular type. The acute stage was followed by a protracted period, during which the fluid was absorbed and some thickening of the periarticular structures took place, giving rise to a condition not unlike that of rheumatoid arthritis, with considerable stiffness and pain on movement. In some cases the course was so prolonged that a permanent disability seemed inevitable, but I remember no case, however protracted, which had not made some progress towards recovery before leaving hospital. In the acute stage rest is necessary, and when the joint was tense with fluid much relief was afforded by tapping and the removal of the fluid. In a few cases treated with antidysenteric serum there was a rapid fall of temperature, with subsidence of joint symptoms. This method of treatment merits further trial, though it should be used with caution in cases that have previously been given serum during the stage of acute dysentery on account of the risk of anaphylaxis. After the acute symptoms have subsided it is a mistake to keep the joint absolutely at rest; massage and carefully regulated passive movements should be employed, and radiant heat is useful. The joint fluid is generally turbid, and in one case of a series of ten examined bacteriologically by Captain R. R. Elworthy, R.A.M.C., a Shiga bacillus was isolated from the fluid and cultivated. In the remainder of the series the fluid was sterile. Dysenteric arthritis is readily distinguished from serum arthritis by the lateness of its onset (usually between the fourteenth and twenty-third days of the disease) and by the comparative severity and long duration of the lesions. An interesting point is the almost constant association with conjunctivitis, which was a useful herald of the advent of arthritis, since it appeared usually about 48 hours, but sometimes several days, in advance of the joint condition.

Nervous Complications.

These were observed in sequel to both amœbic and bacillary forms of dysentery. A man who had just completed a second course of emetine treatment for an attack of amœbic dysentery after three months from the onset of his symptoms developed paresis of the legs. On the next day (July 14th) the knee-jerks, which had been present on the 13th, were unobtainable, and there was weakness of the grasp on both sides. On the 15th there was difficulty in swallowing, breathing was laboured, and the voice was hoarse. Two days later (July 17th) there was complete loss of power in the legs, which were flaccid. Sensation was unimpaired. On the 18th there was anæsthesia on the inner aspect of both legs and knees, there was very little power in the recti muscles, respiration was chiefly intercostal, and the patient was unable to puff out his cheeks. The cerebro-spinal fluid was under slight pressure; its characters were normal. On the 21st there was incontinence of urine and fæces. In the course of the following days breathing became very difficult, the patient was irritable and restless, and on the 25th he died, 12 days after the onset of nervous symptoms. Post mortem the meninges of the brain were congested and the cerebro-spinal fluid was in excess, otherwise there were no macroscopical lesions of the nervous system. The intestines showed evidence of long-standing dysenteric ulceration. Unfortunately no data as to the microscopical lesions were forthcoming. In another case of clinical dysentery, not bacteriologically proved, paresis of both legs and both arms, with loss of deep reflexes, supervened a fortnight after the cessation of intestinal symptoms. The cardiac dullness was increased both to the left and to the right, the breathing became embarrassed, and the patient died of heart failure 19 days after the onset of paresis. Post mortem all the chambers of the heart were dilated, the brain and meninges were congested and œdematous, and marked degenerative changes were found in sections of the popliteal and vagus nerves that had been removed for examination.

Amœbic Hepatitis.

This subject is one that would be more fittingly dealt with by one of my surgical colleagues. Some scope, however, was provided for the exercise of the physician's art, both in diagnosis and treatment, as the diagnosis largely depended on the correct reading of the physical signs produced by an upward displacement of the diaphragm, usually on the right side, with shifting of the heart to the left and collapse of the lower portion of the right lung; also, by prompt emetine treatment the process was often arrested in the pre-suppurative stage.

Brief particulars may be given of two cases with unusual features, the records of which were kindly supplied to me by Major St. J. D. Buxton, R.A.M.C. The first case was of interest owing to the occurrence of general peritonitis, which supervened without obvious cause four weeks before pus was located in the liver and cleared up satisfactorily after operation and the removal of seropurulent fluid from the abdomen. Subsequently a right-sided pleurisy occurred with clear effusion, which became converted into an empyema owing to sloughing of the diaphragm and escape of the contents of the liver abscess into the pleural cavity, as was shown later at the operation. This patient made a good recovery. The second case, a fatal one, was remarkable for the presence of two large abscesses in the right lobe and numerous small abscesses about the size of a pea in both right and left lobes of the liver; one of the two larger abscesses was incised and drained, but was found at the autopsy to have leaked downwards below the colon and cæcum. In view of the multiple foci of suppuration it is clear that no further operative measures could have saved the life of this patient. The association of a clear pleural effusion with pus in the liver was observed in another case, the nature of which was obscure until in the course of the fifth week a large aspirating needle was introduced into the right pulmonary base and six ounces of very thick pus were withdrawn. In the course of operation on the following day clear fluid, through which the aspirating needle must have passed, was found in the pleural cavity; below this was a liver abscess, which was incised and drained.

In the dysenteric wards there were always to be seen the best instances of *combined infections*, with a complex clinical picture, in which it was often difficult to assess the relative importance of the various infective agents. The case may be quoted of a patient admitted to hospital with a proved Flexner infection. As the result of pathological observations initiated on the following day subtertian parasites were found in the blood, *Entamœba histolytica* in the stool, from which Shiga bacilli were also isolated. Three days later he fell a victim to influenza; bronchiolitis supervened and he succumbed. Total, five distinct infections.

Treatment.

Among the many points of interest which might be discussed in connexion with the treatment of dysentery I will make no reference to the important subjects of dieting and the use of salines and will confine my remarks to two points only: (1) the use of serum in bacillary dysentery, and (2) the value of emetine in amœbic cases.

As regards serum treatment we were at a disadvantage in being supplied with a polyvalent serum of whose specific properties we knew very little beyond the fact that in different samples agglutinins against the various types of dysenteric organisms were represented in very varying degrees. The situation was to some extent cleared in 1918 by Colonel Dudgeon, who by his observations on 17 samples of sera showed that many of them were very deficient in agglutinins, especially for *B. Shiga*, which were precisely the ones for which we had the greatest need, as the Shiga bacillus was undoubtedly the organism responsible for the bulk of the more serious cases of acute dysentery. If it had been practicable to supply us with pure anti-Shiga and anti-Flexner sera more striking results would doubtless have been obtained. Even as it was, working with sera of undefined therapeutic properties, a favourable impression on the whole was formed of the value of serum treatment, given two conditions—(1) that the serum was administered at the earliest possible moment, and (2) that sufficiently large doses were used. The tendency with serum in dysentery, as with quinine in malaria, was to give increasingly large doses as our experience grew, and latterly amounts of 80 to 100 c.cm. were given subcutaneously in all cases with the clinical features of an acute bacillary dysentery immediately on admission, without waiting for a bacteriological report. The dose was usually repeated on the following day, and again on each of the succeeding two or three days, in the same or reduced amount, according to the course taken by the disease. In cases of special severity serum was given intravenously in combination, if necessary, with normal saline or isotonic glucose solution. The value of intravenous saline was very great in dehydration cases with copious watery stools, a condition in which the maintenance of the body fluids is of the utmost importance. The prospective benefit of serum treatment in any given case rapidly lessens with the lapse of time from the onset of symptoms, and the opinion was formed that nothing is to be gained by the inauguration of serum treatment later than the sixth or seventh day of the disease. Serum rashes and transient joint symptoms were not uncommon; these were sometimes accompanied by severe febrile reaction; true

anaphylaxis was, fortunately, very rare. A valuable article on the diagnosis and treatment of dysentery in the British Salonika Force was read by Lieutenant-Colonel Duncan Graham, C.A.M.C., at a meeting of the Salonika Medical Society in May, 1917, and published later in THE LANCET of Jan. 12th, 1918. In the light of subsequent experience it is interesting to note his opinion, expressed at that time, that less than 3 per cent. of the dysentery in the Salonika area was of the amœbic type.

In the treatment of amœbic cases emetine was of the greatest value in controlling acute symptoms and causing the disappearance, at least for a time, of cysts and amœbæ from the stools. But in a large proportion of cases the benefit was temporary, and periodical examination of the stools sooner or later disclosed the reappearance of organisms, though the accompanying intestinal disturbance might be of very slight severity, amounting only to looseness of the bowels, with or without the presence of mucus in the stools. From figures supplied to me by Captain C. W. Budden, R.A.M.C., who was in charge of the special section at the convalescent depôt to which dysentery cases were discharged, it appeared that of all dysentery relapses, 65 per cent. were in amœbic cases, and that of all amœbic cases which came under his care 75 per cent. never became sufficiently fit to return to duty. It cannot be said that these patients had not received adequate emetine treatment; in every refractory case at least two, and sometimes more than two, full courses of emetine were given, though it was eventually realised that if a patient was not cured by a second course it was waste of time to give further treatment in Salonika, and that the only prudent course was to evacuate him from the command as soon as possible. The value of emetine in acute dysentery was very similar to that of quinine in malaria—that is to say, of the greatest use in controlling the acute manifestations of the infection, but disappointing when used for the purpose of eradicating the parasites from the system. A course of emetine lasted for 12 days, during which the patient either received ⅔ gr. hypodermically twice daily, or 1 gr. hypodermically, plus ½ gr. by the mouth daily, or 3 gr. of bismuth-emetine-iodide by mouth, either alone or in combination with hypodermic treatment. From statistics in No. 15 of the Special Report Series of the Medical Research Committee it appears that emetine treatment meets with a greater measure of success here in England than was the case with us. This is no more than one would expect, and justifies our policy of the early evacuation of cases which did not rapidly clear up.

The criterion adopted for the discharge of bacillary cases from both hospitals and convalescent depôts was a purely clinical one; after a week on full diet and in the absence of intestinal symptoms the patient was regarded as fit to leave hospital, and similarly if there was no recurrence of symptoms during his stay at the convalescent depôt, and his general health was good, at the end of three weeks he was passed as fit for duty without bacteriological examination. Special importance was attached to the presence of mucus in the stools as evidence that the dysenteric process had not completely subsided.

ENTERIC GROUP.

Of the enteric group I have very little to say. The troops were well protected and the incidence was small. Fig. 4 shows the incidence of all forms grouped together

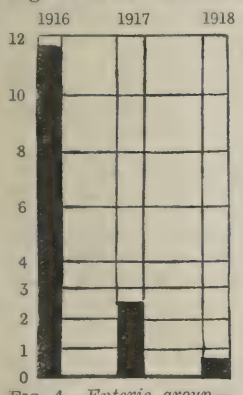

FIG. 4.—*Enteric group.*—Showing incidence of all forms as a ratio per 1000 troops.

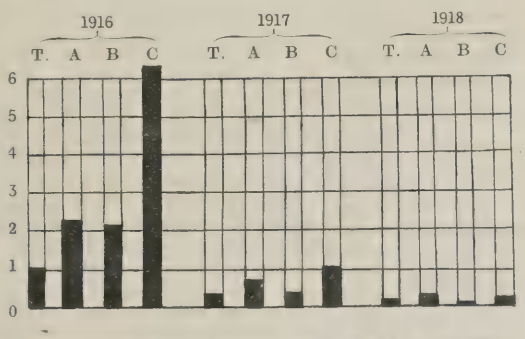

FIG. 5.—*Enteric group.*—Showing relative incidence of different varieties. T., typhosus; A, para A; B, para B; C, clinical.

for the three years 1916–18. It is seen that there is a marked drop from 11·77 per 1000 troops in 1916 to 0·84 per 1000 in 1918. In Fig. 5 is shown an analysis into the various members of the group for each of the three years. I cannot explain the large number diagnosed as "enterica, clinical" during 1916; it is out of proportion not only to the pathologically proved cases in the same year, but also to the number of "clinical cases" in the following years. Of cases pathologically proved it is seen that most were paratyphoid, para. A being in excess of para. B, specially in the two later years. The disease with few exceptions was of a mild type, and only 65 deaths occurred during the whole period. The case-mortality in 1916 was 3·62 per cent.; in 1917, 3·78 per cent.; and in 1918, 4·44 per cent. The majority of severe cases were due to *B. typhosus*, a large proportion of these being admitted to hospital from vessels arriving at the port.

INFLUENZA.

The outbreak of influenza with its attendant complications took a heavy toll of the forces, and was the cause of special anxiety owing to the fact that the height of the epidemic corresponded to the military operations in September, 1918, which led to the defeat of the Bulgars and the signing of the armistice with Bulgaria. The total admissions for influenza and pneumonia during 1918 were 17,813, being at the rate of 111·33 per 1000 troops, and the total number of deaths was 1387, or 8·67 per 1000; that is to say, almost 1 man out of every 100 troops fell a victim to the disease. The mortality was greatest during the five and a half weeks from Sept. 22nd to Oct. 30th, when deaths were occurring at the rate of 112 per week.

The epidemic first made its appearance in June in an outlying prisoner-of-war camp near Ekaterini, where there was an extensive outbreak of more than 800 cases, nearly all of mild type. By the end of June cases of what had come to be described as the "prevailing epidemic," many of them with serious pulmonary symptoms, were common in the Janes district, and as at the same time and in the same area there was an outbreak of sandfly fever, and every day showed a rising rate of admissions for malaria, the differentiation of these diseases was often difficult, and a certain degree of confusion in diagnosis was inevitable. At the end of August there was a serious outbreak of disease among Indian troops and Turkish prisoners of war at two adjacent camps at Arakli Farm, near Llangaza Lake; some of these were cases of malaria, but in the majority the illness differed from malaria in the sudden onset without rigor or shivering, the absence of enlarged spleen or splenic tenderness, and the presence of a respiratory tract catarrh. Of the malaria cases in this outbreak there was a great preponderance of M.T. infection, as proved by examination of blood films. Another serious outbreak occurred a week or two later in a battalion 590 strong on the Doiran front; of these, 130 fell ill, chiefly from two companies, in the course of three days; the infection spread rapidly, and in a couple of weeks the whole battalion was, in the words of the medical officer, "almost burnt out." In the earlier stage of the influenza epidemic attempts were made by segregation of the sick to prevent its spread, but these proved unavailing, and the disease rapidly became practically general through the command.

Clinical Features.

The clinical features of the epidemic in Macedonia do not appear to be essentially different from those of the epidemics at home and on the Western front, and I have little to add to the full and vivid account given by Major J. Burnford, R.A.M.C., in a communication to the Medical Section of this Society on April 29th, 1919.

The disease usually began as an intense tracheitis spreading to the bronchial tubes, and in the more severe cases rapidly involving the finest elements of the bronchial tree

with a patchy consolidation of lobular type. A true lobar pneumonia was comparatively uncommon, but frequently so many lobules were involved that the condition became confluent and the physical signs were indistinguishable from those of a lobar consolidation. Pleurisy and empyema were common complications. Other grave complications were necrosis of the lung leading to multiple abscesses, pericarditis, and meningitis. In one case next to no normal lung tissue was left; the lower lobes, middle lobe, and central part of the upper lobes were in a state of necrotic disintegration, crumbling under the finger, and readily separated from the pleura and the connective framework of the lung. The remainder of the upper lobes was emphysematous, some of the bullæ being of the size of a Tangerine orange.

The course of the disease was sometimes very rapid. In the case of a V.A.D. a state of generalised bronchiolitis was developed within a few hours, causing intense dyspnœa and cyanosis, with fine bubbling râles audible over the whole surface of the chest. Death took place within 24 hours of the onset. A common feature was the abundance of thick purulent sputum, sometimes streaked with bright red blood. This was difficult to expectorate, and its accumulation in the bronchial tubes led to marked dullness on percussion and complete abolition of breath sounds over the affected part. Voice vibration was diminished or absent, and in some cases these "silent" lungs could hardly be distinguished from pleural effusion except by the exploring needle. In some cases there was a rapid poisoning of the cardiac mechanism by toxins, and death was due to heart failure; in others there was prolonged resistance, the pulse remaining good till near the end, death apparently being due to the mechanical effects of a prolonged blocking of the bronchial tubes. Little could be done for the relief of this condition, which was most distressing, the patient literally fighting for breath and life over a period of many days. An interesting group of cases was that in which the temperature came down by lysis, and there ensued a long apyrexic period, during which the patient steadily lost ground and ultimately succumbed. In other cases sudden death occurred from cardiac failure after the fall of temperature and when the patient was apparently progressing towards a satisfactory convalescence. Cases were, unfortunately, common in which influenzal pneumonia was complicated by an acute attack of malaria, a combination which usually proved fatal.

I cannot leave this part of my subject without paying a tribute to the devotion and utter disregard of personal risk displayed by the nursing staff on duty in the wards reserved for serious cases during this epidemic. The work in these wards was extremely heavy, and the risk of catching a disease which might prove fatal was a very real one; but they did not spare themselves and the nursing of the sick throughout the emergency was worthy of the best traditions of the profession.

SANDFLY FEVER, &C.

Outbreaks of sandfly fever occurred at various places during the hot seasons, specially at Janes and at Chanak, and on more than one occasion the routine work of a medical unit was carried out only with great difficulty owing to the rapidity with which one member after another of the community fell a victim to the disease. Distinguishing points from malaria, apart from the blood examination, were the conjunctival injection with pain behind the eyes, the severe character of the pains in back and limbs, and the fact that with an equal degree of pyrexia the patient was not so much under the weight of his illness as during the actual attack of malaria. Initial rigors were rare, and the temperature curve, with its maximum on the first day and its gradual fall during the two following days, was unlike that of any type of malaria. The subjective feelings of the patient were different in the two diseases; a patient with sandfly fever who had had previous experience of malaria was always emphatic that his present illness was something different from malaria. The presence or absence of sandfly bites gave no help, as it was common during the sandfly season for patients with malaria to bear the marks of previous bites: on the other hand, sandfly fever might occur without any marks on the skin or any knowledge on the part of the patient that he had been bitten.

Sporadic cases of *acute meningitis* were seen from time to time, the majority being due to the meningococcus, while others were in connexion with the influenza epidemic. In one case of meningitis involving both brain and spinal cord films and cultures from the meninges showed a Gram-positive coccus; cultures from the heart's blood obtained post mortem also showed a Gram-positive coccus which was morphologically identical with *Staphylococcus aureus*.

In 1917 a *neurological section* was started at one of the general hospitals, in which invaluable work was done by Captain T. Graham Brown and Captain R. M. Stewart, R.A.M.C., who were in charge of the department. As I understand it is their intention to publish a full account of the work of the department, I will make no further reference to it here.

TREATMENT OF PRISONERS IN BULGARIAN HOSPITALS.

Shortly after the armistice I made two expeditions to Bulgaria, as far as Sophia, and from there to Pirot, just beyond the Serbian frontier. In the Bulgarian hospitals at Sophia there were a few of our men who had been taken prisoners of war and were being treated for wounds or sickness. None of them were seriously ill, and in conversation they all expressed themselves as satisfied with the way in which they were being looked after; they were evidently receiving the same attention as the Bulgarian patients, and so far as could be seen the Bulgarian doctors were well trained and skilful, though much handicapped through shortness of medical supplies and appliances. There was also great scarcity of provisions, and our men found it necessary to supplement their scanty rations by buying bread, as far as their resources permitted, at the exorbitant prices which were ruling in the town. One of the hospitals was equipped with a complete set of Zander apparatus, a gift from the German Red Cross at the beginning of the war; when the Bulgarian collapse was imminent and the Germans left Sophia they wanted to take this costly apparatus away with them, and had to be reminded by the Bulgars that it was a gift, not a loan.

Very different was the treatment of Serbian prisoners-of-war patients by the Bulgars. At Radomir, an hour's run from Sophia to the west, was a concentration camp for prisoners of war, and attached to this was a so-called hospital. The dysentery ward was crowded with patients lying on filthy mattresses on the floor, two or three to each mattress; these patients were mostly suffering from acute dysentery, and were supplied with no conveniences and no attention beyond what they could give one another. A Bulgar doctor was supposed to see them daily, but I was told that before the arrival of the British he seldom visited this ward and the only regular attention they received was a morning visit from orderlies to look round and remove the bodies of those who had died during the previous 24 hours. As I was leaving the ward one of the inmates in a far corner called out to me in English; he was one of our men who by some mischance had got mixed up with the Serbian patients; it was not many hours before he was being cared for in a section of a F.A. that had recently arrived at Radomir, to his unspeakable relief. He was suffering from a severe attack of dysentery, but when I last heard of him he was doing well. Thanks largely to the energy of Colonel J. Ward, D.S.O., backed by the Bulgarian D.M.S., who gave what help he could, hospitals for sick and wounded Serbs were rapidly organised and staffed by our R.A.M.C. at Sofia, Radomir, and later at Pirot, where Serbs once more after long disuse were able to enjoy the advantages of good treatment and careful nursing.

TYPHUS AND RELAPSING FEVER.

A few cases of typhus and relapsing fever occurred in the Macedonian area. Both these diseases became relatively more common after the movement of troops to Constantinople and the Caucasus, though there was never anything approaching an outbreak on a large scale. The Weil-Felix reaction was of value, specially in mild cases, though its usefulness was restricted owing to the fact that a positive result could not be expected earlier than the fifth day, by which time the diagnosis had in most cases become clear on other grounds.

From investigations made by Captain J. Warnock, R.A.M.C., it appeared that the rise in the agglutinating power of the serum was very rapid, and in the course of 24 hours there might be an increase from 1/25 or 1/50 to 1/100, which was taken as the standard for a positive result. This standard was reached on the fifth day, sometimes earlier, and was followed by a rapid rise in agglutinating power, until at the end of the pyrexial period (tenth to fourteenth day) a reaction was obtained with a very high dilution—e.g., 1 in 3000, 1 in 8000, and in one case 1 in 32,000. The subsidence of fever was followed by a rapid fall in the reaction. Control observations were made in cases of relapsing fever, cerebrospinal fever, small-pox, typhoid fever, malaria, influenza,

pneumonia, syphilis, and in normal individuals with negative results.

As an example of the utility of the reaction a case may be quoted in which marked meningeal symptoms were present at the onset; as a result of lumbar puncture a few drops of semi-gelatinous mucoid material were obtained containing scanty lymphocytes and no micro-organisms; the Weil-Felix reaction was positive on the seventh day with a dilution of 1 in 100; on the tenth day it was marked at 1 in 1600, and slight at 1 in 3200.

In the state of profound toxæmia, which characterised the severer forms of typhus, benefit was derived from repeated intravenous salines. In the case of a patient at Tiflis who was desperately ill, in a semi-delirious state with low temperature and irregular pulse almost imperceptible at the wrist, and dry, thickly-coated tongue which could hardly be protruded, this procedure seemed to be the turning point of the illness, and when seen a week later he was convalescent. Among the complications and sequelæ of typhus observed in our own units and in Russian hospitals, I may mention suppurative parotitis, otitis media with mastoid disease, bronchitis and broncho-pneumonia, femoral thrombosis, and hemiplegia. In one case a complete unilateral paralysis of head, arm, and leg developed gradually in the course of three days during convalescence.

VISITS TO CIVILIAN AND MILITARY HOSPITALS IN RUSSIA.

While travelling in the Caucasus and Southern Russia in the summer of 1919 I had opportunities of visiting hospitals, both civilian and military, other than our British ones. At Batoum I visited the general hospital for the province and the infectious hospital for the town, both civilian hospitals, but under different management.

The first was fairly well run on very limited resources; they were short of drugs and all kinds of medical appliances, but the hospital was clean and they were making the best of a difficult situation. The cases were chiefly relapsing fever and convalescent typhus. The town hospital was a contrast in every way: the wards were crowded and filthy, the bedclothes were grimy; flies were everywhere, and the atmosphere on a hot afternoon with closed windows can be better imagined than described; outside one of the wards was a cesspool overflowing into the hospital grounds.

At Tiflis Colonel Wenyon and I were taken over the Georgian Municipal Hospital, a fine building in extensive grounds, with clean and well-arranged wards and adequate laboratories. The methods here were up-to-date and the standard of clinical work was high. The clinical material was excellent and we spent a long morning in the wards, seeing many interesting cases. From Tiflis we went up to Erivan to investigate the circumstances of a case of suspected cholera among our troops, and were shown round one of the military hospitals by an Armenian doctor. The chief clinical interest was in the wards where cases of "typhus recurrens," or relapsing fever, were under treatment. Of the numerous charts shown to us there were only one or two with more than a single relapse, notwithstanding the fact that no arsenical preparation was used in treatment. When asked why he did not give salvarsan, the doctor replied that it was unnecessary, as the cases were mild and invariably recovered without special treatment; he said he had never had a death from the disease, but I think the chief reason for withholding salvarsan was the fact that he had none to give. At many of the other hospitals I made the same inquiry and received a similar answer; it was clearly the local view that relapsing fever was a comparatively mild disease, and that deaths were very rare.

Lice in the Hospitals.

From Batoum I went north to Novarossisk and Ekaterinodar, which at the time was General Denikin's headquarters. At both these places in early June the prevailing disease was relapsing fever; there were also many cases of typhus in the hospitals, but the majority were in the convalescent stage. At Ekaterinodar some of the hospitals were well arranged, others were the reverse; a reproach common to all was the failure to keep the patients free from lice. The part played by lice in the spread of disease was well known, but when it came to practical measures there was a lamentable failure in the application of their knowledge. Real difficulties were present in the shortage of change of clothing and bedding, shortage of nurses, and sometimes shortage of water. The first of these was being remedied as far as possible by grants of linen from the British Military Mission, but little or no attempt was made to grapple with the louse problem, with the result that large numbers of the medical and nursing personnel fell victims to typhus. An incidence of 30 to 50 per cent. was regarded as a normal state of things; at one hospital in a vodka factory, with beds almost touching in unventilated and stuffy wards, *all* the personnel had had typhus, a record of which they were proud, instead of regarding it as a mark of the inadequacy of their hygienic service. It is a curious illustration of the mentality of the Russian authorities that, while neglecting such obvious precautions, they were ready to experiment with unproved and speculative methods of prevention and treatment. At Ekaterinodar some of the personnel in typhus wards were being inoculated with what was described as a "vaccine" consisting of sterilised blood drawn from typhus patients at the date of the appearance of the rash. Good results were claimed for this procedure. Also cases of typhus were being treated with serum removed from convalescent patients three to five days after the temperature had become normal. A daily dose of 10 c.cm. was given subcutaneously for three to four days. The account of the benefits derived from this method of treatment was not convincing, and hardly justified the removal of large quantities of blood from those who were recovering from a grave and debilitating illness. At Novarossisk intravenous injections of cyanide of mercury, in doses varying from 0·001 to 0·01 g., were given in 2 c.cm. of water every second day; 300 to 400 cases of typhus had been treated in this way with alleged good results.

The hospitals at Constantinople were, on the whole, clean and well ordered in most respects, except in their nursing arrangements, which were far below the standard which we regard as essential. Everywhere there was a shortage of drugs and medical and surgical necessaries, and all schemes for improvements and developments were held up for want of funds. The children's hospital on the outskirts of the town was a model of its kind, consisting of a number of separate pavilions standing well apart from one another in wooded park-like grounds overlooking the Bosphorus.

I cannot conclude my remarks without paying a special tribute to the D.M.S., Major-General Sir M. P. Holt, K.C.B., K.C.M.G., who was always ready with his advice and whole-hearted support in carrying into effect any recommendations made with the object of improving the details of the medical service, and whose unfailing interest in the clinical aspects of the work was of immense encouragement to all concerned in maintaining a high standard of clinical efficiency. I also wish to express my thanks to Colonel C. B. Martin, C.M.G., Brevet Lieutenant-Colonel J. A. Anderson, and Major W. R. Galwey, O.B.E., M.C., for supplying me with the figures and curves on which the foregoing statistical diagrams are constructed; to my predecessor, Sir J. Purves Stewart, K.C.M.G., C.B., for many kindnesses; to Major H. W. Wiltshire, O.B.E., D.S.O., and Major H. R. Evans, for valuable criticism and suggestions, and to officers-in-charge of medical divisions, and medical officers of the various hospitals, on whose willing coöperation in showing and discussing cases of interest so much depended in collecting the data on which this communication is based.

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THE PHYSICAL ELEMENT IN THE PSYCHO-NEUROSES.*

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ARTICLES and discussions on the pathology of the war neuroses show an increasing tendency to regard mental factors as of much greater importance than bodily, and to look to psychotherapy as the only certain remedy, leading often to a dramatic cure in a time varying from a few minutes to a few hours; it is unusual to find reports of cases which the author has found difficult or impossible to cure.

No one would deny the importance of psychical factors in nearly every disease. Even in such serious conditions as cancer or pneumonia we recognise the beneficial effects of cheerful words of encouragement. The beginnings of disease of the nervous system are frequently associated with, and overshadowed by, hysterical manifestations which may be removed by suitable explanation and persuasion. It is an interesting speculation whether an emotional shock would abolish for a time the severest suffering. For example, if the wife or the child of a man in the agony of angina pectoris or of a paroxysm of trigeminal neuralgia was killed before his eyes, would his pain suddenly vanish and for how long?

But in addition to the beneficial effects of psychical influences on disease, there is evidence that emotional disturbance is an important ætiological factor in maladies other than the neuroses. The symptoms of chorea or of paralysis agitans may begin to develop immediately, or soon after, some severe emotional shock. No doubt in many such cases pathological changes are already present in the nervous system, but there may be no clinical indications of the presence of such changes, the patient appearing to be quite well before the emotional shock. Jaundice is sometimes precipitated by fright, which shows the effect of shock on glandular organs. Some time ago, Sir Thomas Barlow told me of a boy, aged 10, previously well, who was all but run over, just getting on to the kerbstone of the path. That night he became very pale and within a fortnight died with all the characteristic signs of acute pernicious anæmia. These examples indicate that emotional disturbance may initiate serious and even rapidly fatal disease.

Frequency of Relapse in Discharged Neurotics.

Passing now to my experience of the neuroses, I have been much impressed by the frequency with which relapses have occurred in cases which had been discharged from Maghull, Seale Hayne, and other neurological hospitals, as either cured or improved. At the Brinnington Hospital Dr. R. L. Gamlen (the medical superintendent) and I have records of a large number. What is the explanation? What is the pathology of the cases which so easily relapse? A common type of case which tends to relapse often more than once may be outlined as follows:—

A strong young man, never ill before enlistment, is exposed to some nerve-racking incident at the Front, from which he never seems to recover completely. He is admitted to a neurological hospital suffering from extreme nervousness: his limbs shake and his sleep is much disturbed by horrible dreams. After suitable treatment, psychical and other, followed by occupation in the garden or in one of the workshops at the hospital, he gradually improves, and in a few weeks is discharged as either cured or nearly well. He tries light work, but after a week or two has to give it up, owing either to a sudden collapse or to a gradual return of his weakness and tremor. He has now lost his war-dreams and sleeps fairly well. He may be sent again to a neurological hospital where a further attempt is made to discover any mental complex which may account for his condition. Nothing abnormal is discovered; he improves, is discharged, and sooner or later breaks down again.

The inevitable conclusion appears to be the presence of some indefinable physical disorder; in some way or other his neurones or other parts of his bodily machinery must be out of gear. But whatever the pathology, it is clear that the removal of tremor, rigidity, or other similar symptom does not cure the patient. His unstable condition may last for years, and we cannot use the term "cure" until the man is able to do his ordinary work with as little inconvenience as he felt before the war.

A Typical Case of a Severe Type.

The following case is an example of a more severe and less common type:—

The patient, aged 35, has been in Brinnington Hospital several months. He was blown up owing to the explosion of a shell in August, 1916, and soon after regaining consciousness began to suffer from severe pains in the head, back, and legs. Then he began to shake, and owing to this symptom and the pains he became unable to walk, and has never walked properly since. On admission to Brinnington, he was a typical rigid tremulous case. His extended legs were like iron bars, and his feet and toes were rigidly plantar flexed. At first the greatest force was required to bend his ankles, knees, and hips, and any movement brought on violent shaking of the limbs. By devoting three or four hours a week to him I have got the knees and hips a little looser, and with a great effort he can now draw up the legs in bed, but it is impossible for him to do this slowly; the movement is a sudden jerky one, and can only be performed by the most concentrated effort. He cannot abduct or adduct the limbs or lift his heels from the bed. If I hold up his heel, his leg being either rigidly extended or passively flexed, and slowly withdraw the support of my hand, telling him to keep the limb suspended, his greatest effort is unavailing; the leg jerks down suddenly on to the bed. When encouraged and subjected to firm pressure on the plantar surface of the toes he can slowly dorsi-flex the foot to a very slight extent; this is a great struggle, and is accompanied by a drawing up of the patella and a rigidity of the calf muscles; in fact, all his energy goes to the contraction of muscles antagonistic to the movement. When told to concentrate his mind on the muscles on the front of his leg, with the explanation that these are the muscles which bend the ankles, he says he feels as if he has nothing to pull at. Inability to move part of the limb is not, however, entirely due to contraction of muscles antagonistic to the movement. After the ankle, knee, and hip are forcibly bent, the calf muscles may become quite flaccid, but he is unable to relax the flexors of the limb; for example, he can maintain forced dorsi-flexion of the foot for any length of time, but cannot bend down the foot and toes without a sudden extension of the whole limb.

Arthur Hurst, Yealland, and other advocates of intensive and continuous treatment, would say that the treatment—suggestion, persuasion, and re-education of the muscles—instead of being limited to one or two hours on odd days, should have been carried on without intermission until the rigidity was overcome, however long that might take. The psycho-analysts would say there is probably some mental complex, the unravelling of which would quickly cure the patient. The reply to these criticisms is that the man came to us from Maghull, where for six months he had been treated by the fatigue method, by psycho-analysis, and by hypnotism. He states that he was hypnotised seven or eight times and that when recovering from the hypnotic state he was told to get up and walk, but was unable to do so. When he left Maghull, his condition was much as it is at the present time.

The prominent feature of the case is failure to innervate the muscles of the legs properly, and we may ask: Is this failure due simply to an altered mental state, or are there actual physical changes in some part of his nervous system?

As to the psychical condition, let me repeat that the case was thoroughly investigated and treated at Maghull, and that having had many talks with the man I am unable to suspect a mental complex. I am also convinced that he is very keen to try anything that will lead to his recovery. It is difficult to avoid the conclusion that there are some physical or chemical changes affecting his motor neurones and interfering in the normal relation between impulse and inhibition, changes which in all probability were set up by the effects of the emotional shock caused by the shell explosion. The observed faulty innervation gives one the impression that there is a block at some synapsis which prevents the proper transmission of cortical impulses to the lower motor neurones.

In some respects the patient's inability to relax or inhibit the innervation of his leg muscles reminds one of the phenomenon described by Kinnier Wilson[1] and Walshe in their article on "Tonic Innervation." They give a detailed account of three cases of cerebral lesion, in which the most striking clinical feature was the patient's inability to relax a given innervation in one or other muscle group. Thus in one case, if an object was grasped by the affected hand the patient was

* The main portion of this communication was given at a meeting of the Association of Physicians in Manchester on May 21st, 1920.

unable to relax the grip for a full minute or more, although he made powerful associated movements with the normal arm, and although the tendons of the antagonistic group of muscles could be seen to tighten. The lesion in each case was in the part of the frontal lobe adjacent to the ascending frontal convolution and was associated with slight but definite involvement of the cortico-spinal path, and with slight spasticity of the affected limbs. The greater the involvement of the pyramidal tract the less marked was the tonic innervation. Two of the cases were cerebral tumour, and after operation the tonic innervation disappeared with the development of a post-operative hemiplegia.

The authors suggest that the symptom is associated with diminution of function of cortico-spinal neurones probably owing to interference with the stimuli reaching them by paths from the psycho-motor area of the frontal lobe. They doubt whether the symptom ever occurs when the cortico-spinal system is intact, but they mention a case of Van Vleuten, which suggests that the specific functions of the pyramidal system may have been normal when the symptom of tonic innervation was first noted. In my case, therefore, it seems possible that although a definite organic lesion can be excluded, there may be a break between the cortical neurones which convey stimuli to the motor centres and the neurones which constitute the cortico-spinal paths.

The Physical Basis.

But in considering the pathology of muscular rigidity, we must not restrict our attention to the pyramidal system. We have been too apt to think of this as the only path by which motor impulses reach the lower neurones, in spite of the suggestion made long ago by Hughlings Jackson that in health the whole of the muscles of the body are doubly innervated both by the cerebrum and the cerebellum, a suggestion verified by Sherrington in animal experiments. We now recognise that motor impulses are transmitted not only from the cortex along pyramidal fibres, but also from other parts of the brain along extra-pyramidal tracts.

The tremor and rigidity of paralysis agitans, and of certain lesions of the mid-brain (Gordon Holmes[2]) and the corpus striatum (Kinnier Wilson[3]) are now attributed to lesions of one or other of these tracts. Thus there are many different ways in which impulses from the periphery may reflexly influence the lower motor neurones—the final common path, as Sherrington calls it, along "which all impulses, no matter whence they come, must travel if they are to act on the muscle fibres to which it leads. Reflexes originated at different distant points and passing through paths widely separate in the brain converge to the same motor mechanism—the final common path—and act harmoniously upon it." It is impossible to speak more definitely as to the situation of the lesion which leads to muscular rigidity, or indeed to the other symptoms of the neuroses, nor have we accurate knowledge regarding the nature of the lesion. This might be a disturbance of structure, as, for example, an inaccurate association of some of the neurones constituting either the pyramidal system or one of the extra-pyramidal paths, possibly due to interference with the normal rates of recovery at various synaptic regions, or to a disturbance of the chemical reactions of the blood and lymph which come into contact with the neurones.

The Biochemical Aspect.

The chemical aspect of the problem and the influence of the sympathetic nervous system are full of interest. The researches of Cannon and others have shown that emotions such as fear and anger are attended by disturbances in deep-lying organs, including a discharge of an increased quantity of adrenalin into the circulation; the adrenalin raises the blood pressure and transforms the glycogen in the liver into sugar. If these energising substances are not worked off by muscular action, it is conceivable that their presence in excess in the blood may lead to pathological effects, to a disordered action of both mind and body which later is expressed by tremors, by tachycardia, by starting at the slightest noise, and by terrifying dreams.

In some cases the continued over-action of the suprarenal and thyroid glands may produce a clinical picture similar to that of Graves's disease. Sometimes sugar is present in the urine, and there is ample evidence that emotional states are frequently attended by an increase of sugar in the blood.†

A vicious circle is established; the emotion produces disturbances in the viscera and glands, and these disturbances react on the emotional states, setting up a constant mental unrest. An important paper by Orr[4] and Rows on the Interdependence of the Sympathetic and Central Nervous Systems throws additional light on this subject. They bring forward evidence to show that the situation of certain organic spinal-cord lesions is determined by disturbance of the sympathetic system, and they suggest that "certain so-called functional disturbances of the central nervous system may owe their origin, or if not that, their tendency to recurrence and permanency to the same mechanism." They quote von Monakow, who, while ascribing great importance to the psychogenetic factor in the neuroses, lays great stress upon the bio-chemical factor. Also Lugaro, who says: the "unconscious" is not necessarily that of the psycho-analyst, psychic unconsciousness; it is conceivably the result of chemical phenomena as unconscious and apsychic as any other.

Factitious Erythema.

As having some bearing on the influence of the sympathetic nervous system I would mention dermography or factitious erythema, a symptom about which I have made numerous observations during the last 18 months. If a blunt instrument—say the end of a Yale latch-key—is drawn firmly over the skin of the front of the chest, or in the interscapular region the pallor produced by the pressure is immediately followed by red at its margins; in a few seconds the redness invades the pallid streak and becomes diffuse with blotchy edges; then the flush begins to fade and a central red line is left which has sharply defined margins, sometimes bordered by an area of pallor. The total duration of this phenomenon in health varies from three to five minutes. The erythema reaches its maximum development in Graves's disease, in some cases of which it develops into actual urticaria. Its minimum development is seen in adynamic conditions, as in the final stage of a fatal pneumonia, where only the faintish purplish streak can be elicited. Between these two extremes every variety in rate of development, in intensity and duration, may be observed in different diseases. Its mechanism is obscure; obviously the result of reflex action, it is probably an axone reflex—i.e., it does not involve a nerve centre, merely running up one limb of a bifurcating nerve fibre and down the other. But whatever its mechanism, variations in the tâche must be related to variations in the reactions of the sympathetic nerves, which innervate the peripheral vessels, and to changes in the secretions from some of the ductless glands.

It has been of great interest to me to note that factitious erythema is very pronounced, not only in the "anxiety neuroses," but also in some cases of "conversion hysteria"; thus in two cases of hysterical contracture of the foot, the tâche which was marked, lasted from 45 to 60 minutes. This surely indicates a general as well as a local change—in other words, that true hysteria is not wholly represented by a paralysis, an anæsthesia, or other local manifestation, as is stated by Babinski and Hurst.

I have never felt satisfied with their definition of hysteria as a condition in which symptoms are present which have resulted from suggestion, and are curable by psychotherapy. My observations on hysterical anæsthesia, especially in children, have prejudiced me against such a limited view, and I would refer to a paper on hysterical analgesia in children written by Sir Thomas Barlow[5] nearly 40 years ago. The children varied in age from $2\frac{1}{2}$ to $11\frac{1}{2}$ years. Sensation had not previously been tested, and Barlow took every precaution in the testing. He found that in addition to

† See an article on Hyperclycæmia in Mental Disorders, by F. H. Kooy, Brain, vol. xlii., part iii., p. 214.

the limb or limbs in which analgesia was so profound that strong faradism did not make the child wince, some other parts of the body showed a lack of ordinary response. It is difficult to believe that in such cases there can be the elements of expectant attention or of auto- or hetero-suggestion. It is easier to believe that in the state called hysteria there is a general alteration of the nervous system, and in some of the shock cases either a blood or a secretory gland change.

Conclusion.

In conclusion, the above remarks are meant to apply only to genuine cases of the neuroses. The difficulty in discriminating between malingering and a true neurosis is very great, and, as Buzzard[6] says in his remarks on the diagnosis, we are very apt to be biased by our personal feeling towards the patient. He gives an amusing instance of this: a patient suffering from mutism was such a nice fellow that no one would call him anything but a case of hysteria, but his only successful attempt to speak was when he blurted out that he would rather be dumb for the rest of his life than go back to the front. True malingering—that is, conscious simulation—is rare. It is, however, often combined with true hysteria, or unconscious simulation, and it is such combinations that I think lend themselves most readily to dramatic cures.

I have dealt with the underlying physical basis of the neuroses, because there seems to be a tendency to lay undue stress on the psychical factor. At any rate, it seems likely that molecular disturbances of the nervous system and altered blood states largely account for the *long duration* of many cases and for the *great tendency for symptoms to relapse* on the slightest provocation, whether that be undue exertion, loud sudden noises, or family or business anxieties.

In the most common type of case I believe that better results will be attained by fresh air, sunlight, cheerful surroundings, and light work, than by continuous searching for a hidden mental conflict. Of the value of psycho-analysis in certain intractable cases where there are reasons for suspecting a repressed memory or complex, I am not competent to express an opinion. Nor am I tempted to undertake the necessary investigations when I read that a three years' study of the subject is essential, and that to unravel a complex, to trace some of its elements back, possibly to some incident in childhood, often a very muddy one, may occupy the constant attention of the psycho-analyst for at least several months, and sometimes for a year and even longer.

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THE INFLUENCE OF SUGGESTION ON BODY TEMPERATURE.

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MORE than two years ago I published in this journal[1] a paper describing experiments in which blisters were produced by hypnotic suggestion. Since that time I have made the same attempt in perhaps half a dozen cases without success. But I have recently had under observation another case of the same kind in which a blister was formed even more rapidly than in my previous case. I do not propose to describe this experiment, for it was not dissimilar to the last. This case, however, showed a very remarkable susceptibility to suggestions of heat and cold, which was not purely subjective, but produced a rise and fall of temperature as measured by the thermometer. The temperature of both hands was taken with the bulb of the thermometer held firmly in the middle of the palm, and found to be—right, 89° F.; left, 90° F. Then suggestions of "cold" were made relative to the left arm. Subjective feelings of cold were felt immediately, but no change in temperature took place for three minutes. Then the temperature began to fall, till it reached 85° in the left hand, whilst it remained at 89° in the right. This change took place in the course of ten minutes, and the thermometer was still descending when suggestions of "warmth" were made, which restored the temperature to 89° in the right hand.

Later in the day a much greater change of temperature was obtained by suggestion. The patient was taken out for a five-mile walk without gloves and carrying nothing, and with both hands free, in order to equalise the temperature in both hands. Suggestions were then made of "cold," this time to the right arm, for purposes of control. The arm immediately began to get chilly, subjectively and objectively. In half an hour the temperature in the left palm was 94°, whilst that in the right was 68°. It is interesting to note that this temperature—68°—was the exact temperature of the room at the time, the circulation having apparently no effect on the skin temperature. The right hand appeared and felt to the touch extremely cold, and great discomfort was produced. To the touch the right hand felt like ice, whilst the left hand was comparatively warm. Leaving the thermometer still in the palm of the hand, I then suggested the right hand warm again. Almost immediately the thermometer began to rise, till at the end of 20 minutes the right hand stood at 94° and the left at 95°.

A further remarkable incidence is that, though I have frequently hypnotised this patient, the suggestions of this experiment were made *entirely in the waking condition.*

Relation of Pain to Inflammation.

As already remarked, I had previously produced "suggestion" blisters in this patient, and a blister was also produced by touching the arm with a heated thermometer case, suggesting in the latter case that there would be no pain, either at the time or afterwards. The result was as suggested; but there was no inflammation surrounding the blister, as there was surrounding the painful blister produced by suggestion. This supports the view suggested in my article of November, 1917, that it is not the inflammation primarily that produces the pain or sensation, but the pain that produces the inflammation.

This principle was generally supported by a further observation. After two days the hypnotic blister became infected by the slipping of the bandages, and produced a more extensively painful and inflamed condition. By a word of waking suggestion the pain was abolished, with the result that in two or three minutes the inflammation was also reduced, and the hyperæmia and redness nearly disappeared. It was then found possible, by suggestion of heat and pain, to restore the wound to a painful and inflamed condition once again. The suggestion of "cold" had a more marked effect than that of "painlessness" in bringing about the reduction of inflammation.

Whilst I have mentioned these experiments in particular, they were not isolated, either in this or other patients. I frequently repeated the raising and lowering of the temperature of the arm in this patient. This phenomenon was produced in other patients, not only by myself, but by Captain G. de H. Dawson and Captain O. Connell at Ashhurst Hospital. In these cases, curiously enough, we were able to *raise* the temperature of a hand, but could not *lower* the temperature by suggestion. It is further noted in the cases I observed that when we suggested "heat" to one hand, it was the other hand that *first* showed signs of rising warmth on the thermometer; and then the suggested hand would go ahead and "beat" the other, till there was a very marked difference between the two. The greatest range of temperature that I have observed is the one detailed above; but Captain Dawson claims to have produced a rise of 20°. This, however, was, I believe, in an arm which corresponded closely to the type known by Babinski as "reflex," with a wound and vascular changes present.

If these conclusions of the effect of suggestion on body—and particularly cutaneous—temperature can be estab-

[1] THE LANCET, 1917, ii., 678.

lished it will surely be of great import, both to physiology as a whole and to dermatology in particular. Have not some skin diseases been known to be associated with the neurotic constitution? If the auto-suggestion of a neurotic can influence the circulation and depress the nutrition of the skin in the way that our hetero-suggestion has done in these experiments the connexion becomes obvious. The experiments described above are very tentative and suggestive; there remains the more important experiment of determining whether suggestion can raise and lower the *whole* body temperature. My patient, Mrs. N., to whom my thanks are due for these experiments, performed at considerable discomfort to herself, has placed me under the greater obligation of offering herself for further experimentation.

SUGGESTIONS FOR THE MASS TREATMENT OF HOOKWORM INFECTION.[1]

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IN the course of the work of the Malaya Board in the Far East some new data were obtained on hookworm infection and its treatment and on malaria, data of value to the doctor, the employer of native labour, and the administrator. The Malaya Board consisted of Dr. M. A. Barber, Dr. H. P. Hacker, and myself as chairman. It worked in Malaya, Java, and Fiji under the auspices of the British Colonial Office and the Netherland Indies Health Department, and was supported by the Rockefeller Foundation. The object of its researches was to ascertain to what extent hookworm infection affected the working efficiency of the people in the countries named. Our work disclosed the fact that hookworm infection exists to a greater extent in the tropical East than is generally recognised. In most communities and districts the great bulk of the people are agriculturists. Practically 100 per cent. of adolescents and adults of this class are infected with hookworm.

It was shown very positively that there is a correspondence between the degree of infection—that is, the actual number of worms harboured—and the amount of blood loss or anæmia suffered. This loss was frequently hidden or undetectable due to abundant food, opportunities for rest, and to active hæmatopoiesis in certain resistant individuals, but the drain and loss were none the less real, and constituted a tax on the vital powers.

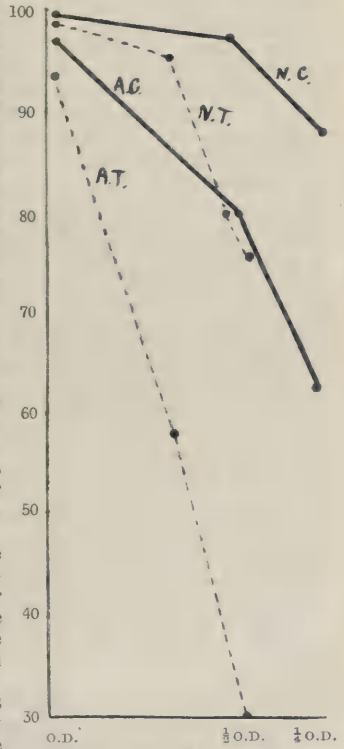
Working with a large number of persons from whom practically all the hookworms had been expelled by vermifuge and counted it was estimated that a given number of hookworms produced a corresponding amount of blood loss. A given number of worms produced more anæmia among children than an equal number in women, and more among women than an equal number in men. Furthermore a given number of *Ankylostoma duodenale* was found to produce a greater degree of anæmia than an equal number of *Necator americanus*, probably due to the more severe hæmorrhage caused by the former worm. Finally, it was estimated that about 12 hookworms are required to cause a loss of 1 per cent. hæmoglobin. When the number of worms harboured is considerable the anæmia caused is evident and measurable; when but few worms are harboured the blood loss may not be detectable.

It is extremely important that emphasis be placed on this fact that hookworms are constantly causing losses of blood through multiple small worm-bites.

Observations made by the Malaya Board are of such a character that the amount of blood loss caused by hookworms and the resulting loss of efficiency can be demonstrated graphically to planters and other employers of labour. Using a rigorous method of diagnosing cases of infection by the administration of vermifuge and comparing it with the less accurate method of microscopic examination of fæces for ova it was ascertained that a larger proportion of the inhabitants of tropical countries are infected with hookworms than is generally suspected. For example, where the microscopic examination revealed in the hands of the lay microscopist an incidence of 75 per cent. infection, diagnosis by vermifuge revealed an incidence of 97 to 100 per cent. The usual method of diagnosis of hookworm infection by microscopic examination of stools for ova does not convey a quantitative idea of the severity of the infection—i.e., the number of worms harboured by an individual—and the degree of injury wrought on the patient. The grade of infection existing runs from 1 to a thousand or more worms. In some villages the average is 40–50 or less; in others 100–150 or more; different villages and special groups of people present infections of different grades of severity.

Diagnosis by means of vermifuge disclosed another fact of extreme importance—namely, that many persons are harbouring a large number of worms, and, consequently are suffering unconsciously from a severe drain in proportion to the number of worms harboured. Thus, a notion was derived not only that oftentimes a higher degree of infection existed than was suspected, but a working knowledge of the number of worms actually being harboured (frequently large) by the people of a locality was obtained. In campaign work it is important to ascertain the number of worms being harboured, for it is more desirable to institute campaigns for treatment in communities where the infections are heavy than where they are light.

The therapeutics of several vermicides, more particularly chenopodium, were investigated by a method in which the efficiency of the drug is expressed by the percentage number of worms a given dosage is able to remove out of the total number harboured. The vermicides could thus be compared one with another according to the actual number of worms removed—the percentage of total worms removed. This affords a more direct and trustworthy index of the efficiency of a vermicide than microscopic examinations of fæces for ova. Chenopodium was found to be more effective than thymol in killing hookworms, and it was even more efficacious in expelling ascaris and other helminths such as oxyuris, trichiuris, and trematodes. Other things being equal, it is better to use the most efficacious drug.



N.C., necator expelled by chenopodium; A.C., ankylostoma expelled by chenopodium; N.T., necator expelled by thymol; A.T., ankylostoma expelled by thymol; O.D., optimum dose.

Toxic symptoms are elicited with all vermicides in the higher dosages; it is therefore necessary to reduce the dose given to as small an amount as possible. Chenopodium retains its vermicidal efficiency upon reduction in dose better than thymol, and this is another reason for its employment. The Malaya Board ascertained that the dosage, 1·5 c.cm. oil of chenopodium, was highly efficient and but slightly toxic, sometimes causing transient dizziness and vomiting. Two treatments of this dosage removed 99 per cent. of the hook-

[1] This paper is based on work done in Java and Brazil, where I was assisted by Dr. M. E. Barnes and Dr. W. G. Smillie, and in part on work done in Malaya and Fiji with Dr. M. A. Barber and Dr. H. P. Hacker. Certain data are extracted from our joint report to the International Health Board which will appear later.

worms present, and this is the dosage recommended. It has a more uniform action—that is, fewer failures occur with it than with thymol; it has a more powerful effect on *A. duodenale*, and is less unpleasant to take than thymol. Not only is the cost of oil of chenopodium much less than that of thymol to effect a given result in worms removed, but oil of chenopodium being a fluid, its vermicidal powers are more uniformly applied, and relative failures in reaching and affecting the worms are less common than with the solid thymol, the spreading powers of which are limited by its physical state. This is an extremely important point to be considered.

The Malaya Board found thymol less effective than chenopodium, and in the following degree (see chart). When the effect on ankylostomas and necators is charted, the more rapid fall in efficiency of thymol over chenopodium with the reduction of dosage is well shown, both in regard to necator and ankylostomas.

Administration of chenopodium in massive or broken doses.—Treatments with 2 c.cm. chenopodium in one massive dose were compared with those in which the oil was given in two broken doses; the difference in efficiency, 95·8 per cent. in the former and 96·15 per cent. in the latter, is slight. Field tests carried out by Dr. Smillie in Brazil show that there is an advantage in the broken dose, as it favours more prolonged contact with the worms, and gives a higher yield of worms removed.

Omission of the preliminary purge.—The omission of the preliminary purge did not materially alter the efficiency of chenopodium in our series when the latter was given in broken doses, but the number of cases was too small to be conclusive on this point.

The purge.—Magnesium sulphate answers the purpose very well; ½ to 1 oz. may be given. Castor oil should not be administered with chenopodium, for it increases the toxic symptoms such as dizziness and deafness. This is probably due to oil of chenopodium being soluble in the castor oil and being absorbed more readily than when given with magnesium sulphate.

With this information at hand, based on experiments in the hospital ward and prison it would seem wise to increase the volume of evidence by conducting additional experiments along the same lines in the field. This is being done. Meanwhile certain modifications in the method of treatment as at present carried out, which would seem to be warranted, may be outlined.

Plan of Treatment.

Personal experience among Chinese, Malays, East Indians, Polynesians, Kaffirs, and Brazilians leads me to believe that an active campaign on an intensive plan rather than a passive dispensary programme must be prosecuted. The people—all the people—must be reached and everyone treated, for they are usually infected with hookworms or other helminths.

Taking the adult agricultural population within the tropics as a whole 90 to 100 per cent. are infected with hookworm and nearly 100 per cent. with helminths. The only place where I encountered a really light infection was in mountain villages in Java and Sumatra. Here only 50 per cent. of the people were infected, and they were harbouring very few worms. The incidence of infection is usually so high that the method of detecting infection by microscopic examination is, as ordinarily carried out, hardly necessary. Consequently within the tropics and where, as in mines and elsewhere, a high incidence of infection prevails the population should be treated *en masse* by an intensive method, and probably without the unnecessary preliminary of examining the stools for ova.

The importance of treating heavily infected communities first.—In inaugurating a campaign against hookworm infection in a tropical country it would seem more humane to select for treatment those communities in which the people are carrying the heavier burden of infection, as, for example, among the agriculturists working in cane, rubber, or coffee. The town-dwellers and others are usually more lightly infected and their case is not so urgent. There is no objection in special instances to treating townspeople, installing latrines, and undertaking educational work for purposes of influencing the agriculturists by means of an example.

In Java, taking men as a class, I found that in four of the kampongs in the City of Batavia the average number of hookworms harboured per man was 50, not a large or relatively incommodious number. In the mountains of the Preanger Residency, in one of the mountain villages, the men harboured only eight worms apiece. In Sumatra, from the Batak highlands, the average was 5·7. On the other hand, in two representative agricultural dessas, of which there are thousands in the East and hundreds in Java, the average numbers of hookworms per man were 378 and 235 respectively. Such numbers constitute a very great burden to the individual and seriously interfere with his health and working efficiency.

There can be no question but that such villages as the last two mentioned should be given the benefit of treatment before the mountainers or the town-dwellers. The information required to ascertain the grade of infection can be obtained within three days and without the aid of microscopists.

If treatment is to be extended rapidly over a vast population, as it should be, the method of treatment must be further simplified, standardised, and cheapened. Millions of people in India are waiting for treatment. The same is true of Brazil and other tropical places. The customary method of examining stools microscopically by a native lay microscopist is expensive, time consuming, and yields untrustworthy results.

Reducing the Cost of Treatment: Economy of Personnel.

Comparing thymol and chenopodium in the dosages in which they yield nearly equivalent results—i.e., 1·5 c.cm. oil of chenopodium, yielding 97·9 per cent. of worms, and thymol, gr. 90, yielding 97·8 per cent. of the worms present, the cost of chenopodium was but $0·027, while that of thymol was $0·135, or exactly 5 times as much. This is based on the cost of thymol at 0·15 cents a grain, and oil of chenopodium at 1·84 a cubic centimetre.

If the method of treatment can be cheapened, the money saved may be used to extend the campaign to places where severely infected people are still waiting for treatment. The Malaya Board inquired into the accuracy of the native microscopist in the East and found that his reports could not be relied on. He was insufficiently trained, his diagnosis was not true, and through a desire to please and to conciliate he would make his microscopic findings fit what he thought was desired. But more than this and of as great importance is the fact that microscopic examination, even when carried out by trained microscopists using a special technique designed to concentrate the ova and thus facilitate the work of detection, fails to detect every case of infection.

This may be seen from the following table: (A) In which the microscope work was done by an expert microscopist using special technique and a re-examination of negative specimens. (B) In which the examinations were made by native or lay microscopists.

Comparison of Results of Microscopic Examination of Fæces for Ova with those of Worms after Vermifuge.

Race.	Result of microscopic examination for ova.		Result by recovery of worms after treatment	
	No. of exams.	Per cent. positive.	No. of exams.	Per cent. positive.
(A).—*F.M.S.*				
Chinese	783	73·4	453	90·1
Tamils	2472	95·3	261	99·6
Malays	206	88·8	97	99·0
(B).—*Fiji.*				
Indian males ...	7637	94·2	131	100
,, females ...			11	90·9
,, children ...			2	100
Fijians, males ...	756	78·7	20	100
,, females ...			4	100
,, children...			9	100
(B).—*Brazil.*				
Brazilian boys ...	72	86·2	72	100

These results of microscopic examinations in the laboratories of the I.H.B. are made by, or under the

supervision of, trained and experienced men. The microscopic technique, when placed in less experienced hands, may be expected to yield results still less trustworthy.

In practice, then, the result of a campaign based on microscopic diagnoses as carried out is to treat thoroughly only a portion of the infected population; the remainder as carriers of infection continue to be a menace. Diagnosis by microscopic examination will vary in accuracy, depending on the skill, persistence, honesty, and technique of the microscopist, and it will probably yield evidences of infection varying between 4 and 23 per cent. less than actually exists. If the microscopists fail to detect this number of instances of infection before treatment, they will probably make almost as great an error in the examinations made after treatment when the number of worms remaining are fewer. Consequently the "cures" based on the microscopic examinations made after treatment are not always valid. The infected persons whose infection the microscopist has failed to detect are not given an opportunity to receive treatment for hookworm, ascaris, tenia, clonorchis, or other helminths with which they may be infected. Moreover, they are given the impression that they are free from infection; yet this large number of infected persons continues to seed their environment, thus leading to their own continued reinfection and to the reinfection of others, including those who have been treated. From a public health standpoint this cannot be regarded in any other light than as unsatisfactory.

The present practice is to treat for "cures"—that is, cases reported as negative by the microscopist after treatment and microscopic examination of stools for ova. But every lot of "cures" contains the error of the microscopist; and besides, a "cure" does not properly indicate the amount of work done in removing worms, nor the benefit received by the patient from the treatments given.

In a recent test made in Brazil we noted that "percentage of cases cured" was not a good indicator of the number of worms removed by treatment, for whereas only 28 per cent. of cases were "cured" by a first treatment of chenopodium, 90·8 per cent. of their hookworms were actually removed, and when only 49 per cent. of the cases were "cured" by two treatments 97·1 per cent. of the hookworms were actually removed. It is evident that worms removed is more important and is a better criterion of work accomplished than the microscopist's "cures." When we consider the millions of people in the tropics in need of treatment and the slow progress of the campaign work, the last few hookworms remaining after two or three 1½ c.cm. chenopodium treatments are probably doing too little harm to waste time and money over.

The Importance of Mass Treatment of Inhabitants Instead of Intensive Treatment of Individuals.

It is not necessary to remove the very last few hookworms, for it is not the two or three worms a man may retain after treatment that are doing the great harm, but it is the 150 or more worms that are busy in the great mass of untreated humanity in tropical and subtropical lands. It is not usual in practice for all the worms to be expelled by treatment; they are reduced to a minimum—a condition highly desirable from the patient's point of view. The public health officer wants every last worm removed from everybody, but that is impossible of achievement. In every district a good number of persons escape treatment; they happen to be ill, are absent, remove to another district, or enter the district after the census has been taken. We may say that 6 per cent. of the population remain untreated. This number, added to the number of positive cases which the microscopist failed to detect, makes a total of approximately 19 per cent. of the total population remaining infected. This number of carriers the public health officer does not get rid of by present methods. Thus while he is striving for "cures" in four-fifths of the population, the other one-fifth escapes him to continue infecting their environment.

Now, by reducing the dosage of chenopodium to a quantity safe and free from toxic manifestations and by giving two or three treatments, and thus removing 97–99 per cent. of the worms, it will be possible to treat the *entire population* in safety, and we shall be making a close approximation to the desideratum of the public health officer.

Hookworm Treatment in Malarial Communities.

Hookworm treatment will oftentimes have to be carried out in communities where more or less severe malaria coexists. It is, in fact, highly important that treatment should be carried out in these places, for hookworm infection appears to be more severe in those cases of malaria which are associated with a palpable or enlarged spleen. It may be that infection with a relatively large number of hookworms favours the development of splenic enlargement and the continuation of this state after acquiring malarial infection, or malaria may predispose to severer hookworm infection; in any case, the fact remains. In Batavia Jail I found that 63 men with negative spleens, though constantly exposed to malaria, had an average of 58 worms apiece, while 14 men with enlarged spleens similarly exposed to malaria had 120 hookworms apiece; 29 men with palpable spleens had 98 hookworms apiece. We have, then, not only a strong reason for treating these cases of hookworm infection whose anæmia is usually so severe, but a reason for treating malaria as well.

It must be explained to the people that their anæmia and debility are not only due to hookworm infection, but to a great—even greater—extent to malaria, and that while it is of great benefit to the individual to be rid of hookworm infection improvement will not follow unless malaria is gotten rid of at the same time. All the anæmia encountered among the people should not be attributed to malaria nor to hookworm. Underfeeding in rural communities plays an important part in contributing to the general anæmia and debility due to these three handmaidens of death.

In Fiji it was estimated that underfeeding resulted in a group of East Indians having 9·5 per cent. lower hæmoglobin than another well-fed group of the same race. Each group harboured the same number of hookworms. In the jail in Batavia taking the 109 treated prisoners as a whole, their hæmoglobin was 25·8 points per cent. below normal (95 per cent.). I estimated that 6·8 points loss were due to hookworm infection, 10·3 points to malaria, and 8 points loss were due to hard labour. In many rural communities the people or the employers of labour can be instructed in the means used to prevent malaria. In the Far East members of the Malaya Board investigated malaria and hookworm infection at the same time. It was their practice to make a malarial survey of each estate visited. They were frequently of service to planters by being able to point out the breeding-places of anopheline malarial carriers, and advise them of the measures which might be taken. In Java during the hookworm survey a malarial survey was made of each district visited, and the amount of malaria existing in the district estimated before beginning the treatments and worm counts. In these backward or neglected communities, where rural hygiene still remains in a primitive state, the men in charge of hookworm prophylaxis have a splendid opportunity to advise the people as to the malarial measures most suitable for the locality. Oftentimes a simple filling, ditching, or drainage operation is all that is needed to destroy a bad breeding-place and to rid the community of its greatest menace.

Suggestions for Conducting a Campaign.

It is first advisable to ascertain the degree of infection in different regions and among different classes of the population in order that groups most severely infected may be treated first. The local medical authorities should be consulted to get the benefit of their knowledge on the severity of cases of infection already encountered. A general inspection of the district or country should be made with the local medical men to ascertain the topographic, climatic, and economic features. The district or country should be split up in such a way

that characteristic groups of the people may be examined and sampled. Plantations and estates cultivating sugar, coffee, rice, or rubber, mining populations, fishing villages on ihe coast, town dwellers, should be treated separately. Attention to the character of soil, altitude, temperature, distance from sea, and proximity to malarial localities, ethnic stock, relative prosperity or economic position, are among the categories which should influence one in dividing the people into groups for sampling.

In coöperation with the administrative medical authorities, a survey may be made. The population is either mustered or visited domiciliarly; the former is preferable whenever possible. A spleen census is taken, and hæmoglobin determinations are made, and blood is withdrawn at the same time for determining endemic index (malarial plasmodia). A representative sample of the population is now chosen; this is based on the results of the spleen and hæmoglobin determinations, and they are treated and their worm counts ascertained; 3 c.cm. of chenopodium is the adult dosage for this. The sample should consist of men, women and children. The worm-count will disclose the number of worms actually being harboured. A knowledge of this is of greater importance than the incidence of infection as determined by the lay microscopist.

With a knowledge gained of the degree of infection actually existing among the different classes of people and in different communities as influenced by occupation and economic conditions, a selection can be made of the districts or classes of persons which it is desired to treat first, naturally with the object of treating first those persons in whom the infection has been demonstrated to be most severe.

All grades of infection will be encountered in the surveys. Some grades will call for immediate treatment, others for deferred treatment. This will have to be thoroughly worked out in the field in accordance with the actual findings. Tentatively it may be said that the grades of infection may be rated as: mild, 50 and under; moderate, 50 to 100; severe, 100 and over.

I should recommend that communities in which the adults have an average of 50 or less do not urgently require treatment, while those with more than 50 should be treated. In carrying out treatment the two-treatment plan may be pursued, microscopists being dispensed with. Every person in the group, excepting very young children, should be treated. Persons ill with chronic nervous diseases may be treated with thymol or other vermicide. Pregnancy and severe anæmia are not contra-indications to the administration of chenopodium. The drug and dosage is chenopodium 1½ c.cm., given in single or broken doses in hard gelatin capsules. The preliminary purge before medication may be omitted, but in this case the evening meal should be light and food then interdicted until after the post-vermicidal purge, which may be given two to three hours after the exhibition of the chenopodium. The post-vermicidal purgation should be very thorough, for it is extremely important that the chenopodium, being a neurotoxic drug with cumulative powers, should be as thoroughly expelled as the worms, and at the earliest possible moment after the drug has accomplished its purpose on the worms.

In hookworm control, if permanent results are to be achieved, prophylaxis as well as treatment of infection must be considered. On first view it would seem that the installation of latrines and the education of the people in their use and in a better personal hygiene requires that the personnel attached to the post should remain in the village long enough to have thoroughly impressed the inhabitants with the importance of the work. They should probably not leave after merely treating them. Nevertheless, important as is the education of the people in a better personal hygiene, the riddance of the hookworm handicap of the people at large is of greater immediate importance. This handicap cannot be fully appreciated by those who are conducting campaigns, unless they actually study the subject by means of the hæmoglobinometer and by making worm counts of representative samples of the population, so as to familiarise themselves with the actual number of worms being harboured by the people. When this is done the oftentimes enormous amount of curable debility and economic inefficiency caused by hookworms is made apparent and may be estimated numerically.

With a knowledge of this debility, as revealed in samples of the population, comes the desire to relieve all the people of it at once, without waiting for the educational part of the programme.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

TWO CASES OF PARALYSIS AGITANS

OCCURRING BEFORE THE THIRTIETH YEAR.

BY E. DANVERS-ATKINSON, M.B. LOND.,

AND

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PARALYSIS agitans (Parkinson's disease) rarely develops under the age of 40, the usual age-incidence being between 50 and 70 years. It is true that a few cases have been recorded in patients under 19, but in some at least it is by no means certain that the diagnosis was correct.

CASE 1.—E. S., aged 30, seen in March of this year. There is no family history of mental or nervous disorder beyond the fact that his mother is said to have died from a "stroke" at the age of 52. He is married and has one child, aged 4, quite healthy.

History of condition.—He states that he has had no previous illnesses of importance, always having been healthy and played games such as cricket and football. He enlisted in the army (infantry) in June, 1916, being classified "A," and proceeded to France in October of the same year. During the winter of 1916–17 his left arm gradually became "weak" and somewhat stiff, but he was able to carry on at duty until September, 1917, when he was slightly wounded in the right arm by a fragment of shell. The wound, however, became septic, and on this account he was invalided to England. On leaving hospital about two months later he states that he "went to pieces"; his limbs rapidly became increasingly stiff, the character of his speech gradually changed, and he experienced great difficulty in getting about owing to general muscular weakness.

Condition on examination.—Cranial nerves: Pupils moderate in size, reaction to light somewhat sluggish, consensual reactions present, accommodation normal; no nystagmus, ocular muscles normal, fundi normal. The face is immobile and expressionless, the mouth invariably slightly open, with occasional dribbling of saliva. The voice is monotonous and the speech hurried. No sensory disturbance. Motor attitude: The head is bowed forward, the back arched, the upper arm held slightly abducted, the elbows flexed, the forearms partially pronated, the wrist and metacarpo-phalangeal joints slightly extended, and the thumb opposed towards the index finger; the hips and knees are slightly flexed. Rigidity of the spinal muscles and limbs is pronounced, and in turning round he rotates as one mass, without movement at the hips or shoulders. "Pill-rolling" tremor is occasionally present, and can be inhibited for a short time on voluntary effort; there is also a periodical antero-posterior tremor of the head. The gait is festinant, and propulsion and retropulsion are both marked. The wrist-, supinator-, biceps-, and triceps-jerks are all somewhat brisk, those on the left side being slightly greater than those on the right. The knee- and ankle-jerks are moderate and equal on the two sides, and the plantar reflexes are flexor. The abdominal and epigastric reflexes are brisk and equal. There is no incoördination of the upper or lower limbs and the sphincters are unaffected. Mentally, he is apathetic, egocentric, and somewhat depressed, but otherwise normal. The heart, lungs, and digestion are normal. The blood-vessels are not unduly thickened, and the systolic blood pressure is 135 mm. Hg. The urine shows no albumin, sugar, nor abnormal deposit. The blood serum yields a negative Wassermann reaction.

CASE 2.—H. B. T., aged 30. There is no history of mental or nervous disease in the family, nor did the patient suffer from any illness prior to 1914.

History of condition.—The patient enlisted on the outbreak of war in 1914 and was sent to Malta on duty. After serving 21 months there, he was invalided home suffering from nephritis; he received treatment in hospital, and after a few weeks was able to return to duty. In May, 1916, he fell from his horse, and states that he sustained "concussion of the brain." This was followed by "traumatic neurasthenia," the symptoms consisting of headache, palpitation, and general nervousness. Finally, he was invalided from the army in January, 1917. About ten months later, he noticed a tremor beginning in the fingers of his left hand, and

states that the left arm "trembled" at night when in bed. After four months the tremor of the left arm had become almost constant, and the same symptom was beginning in the lower limbs. A medical board, in October, 1918, noted the above symptoms, together with a progressive loss of power in the legs, and the facial expression was reported as being "fixed."

Condition on examination (1920).—He complains of general stiffness and weakness, the latter being especially pronounced in the left arm and leg, palpitation, vertiginous sensations, and tremulousness. Cranial nerves: Pupils equal and react normally, no nystagmus, ocular muscles normal, fundi normal. The face shows the characteristic immobility and lack of expression described as "Parkinson's mask." His speech is dull and pitched in a monotone. There are left-sided hyper-æsthesia and hyperalgesia, and cold is felt more acutely on the left side. Motor attitude: The trunk and limbs are held rigidly, and all movements are executed with marked slowness. The gait approximates to the spastic type, but without shuffling of the feet, and in turning patient moves as one piece in a statuesque manner. Propulsion and retropulsion are well marked. There is a slight tendency to a kyphotic attitude, and also for the flexors of the forearm to overbalance the extensors. He exhibits a typical "pill-rolling" movement of the left thumb and forefinger with a rhythmical tremor of the left forearm and leg of flexion-extension type. His control of these tremors varies, at times voluntary effort will control the tremor for a short period, an exacerbation following the period of control, while at others the effort only serves to amplify the tremor. There is considerable weakness of the left upper and lower limbs, particularly the left hand-grip. The wrist, supinator, biceps, and triceps jerks are normal and equal, the knee- and ankle-jerks brisk and equal, and the plantar reflexes flexor. The epigastric and abdominal reflexes are also normal and equal. There is no incoördination of upper or lower limbs and the sphincters are normal. Mentally he is self-centred but otherwise normal. The heart, lungs, and other viscera are normal, the systolic blood pressure is 160 mm. Hg, and the urine pale, of specific gravity 1002, and shows the presence of albumin.

Remarks.

From the above description of these two cases it will be seen that the syndromes closely related to paralysis agitans; and more likely to be met with early in life—such as Wilson's lenticular degeneration, Hunt's and Vogts' syndromes—can be excluded. The cases are of interest not only on account of the unusually early age, but because both patients were soldiers, in whom true paralysis agitans is very rarely seen. In four years of army neurological work during the war, one of us (C. W.-D.) did not meet with a single case of the disease (although many examples of functional nervous disorder were received erroneously diagnosed as paralysis agitans), and Dr. A. F. Hurst informed us last year that his experience had been similar. Further, at the Special Neurological Board (Ministry of Pensions), where many cases of disease of the nervous system are seen daily, no example, excepting the cases here recorded, under 50 years has been met with. This is of importance, as trauma and "shock" are often said to be exciting causes of paralysis agitans.

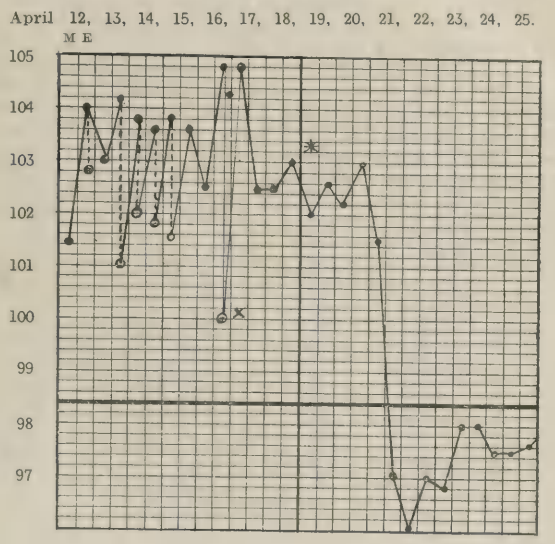
"CENTRAL" PNEUMONIA IN A CHILD OF TWO.

BY H. O. GUNEWARDENE, M.B., B.S. LOND.

THE unusual features of this case are: (1) that the crisis did not occur till the fourteenth day; (2) that the pneumonia was of the central variety and the physical signs of consolidation did not appear till the ninth day; and (3) that the temperature was maintained at two levels during the course of the illness for about nine days between 103·5° and 104·5° F. and for five days between 102° and 103°; the fall to the lower range suggests the crisis following the inflammation of the area of lung primarily involved, masked by the fever due to the subsequent involvement of another area; there is also apparent the so-called precritical rise before the arrested crisis. (See Chart.) The real crisis is a protracted one.

Notes on the Case.

Doris J., aged 2, who had been under my care for some time for another complaint, was brought to me on April 9th, having been sick twice that day and very drowsy. History of two days' illness. Temp. 103·4°; alæ working; pulse 140 (counted at apex); respirations 50; nil in chest, abdomen, throat, or elsewhere; bowels not open. Given ol. ric. drs. 3 stat, and confectio sennæ. April 10th: As above; no physical signs; ? central pneumonia. 11th: As above. Slight impairment of note over right infrascapular region along line of interlobar fissure. Child seems comfortable, but takes very little nourishment. 13th: Restless, sings in sleep, slight cough; tepid sponge b.d.; is visited daily by nurse. Given mist. ipecac. ammon. with pot. brom. six-hourly, aspirin at night. Icebag to the head. 14th: Pallid; good heart sounds, no dullness to right of sternum; respirations 60; note impaired as before. Brandy m. 30, six-hourly. 15th: More pallid. Restless at times; impaired note along line of fissure as well as above it, and also over right mid lobe. 16th: Dullness marked; distant bronchial breathing over infrascapular region; phenazonum gr. 3 at 7.30 P.M. 17th: Physical signs as above, with a few fine crepitations at the end of inspiration, ? pleural. Attacks of breathlessness fairly frequent. Strychnine hypodermically b.d. Appearance much better and breathing easier after strychnine. 18th: Restless at night; bronchial breathing, also in front above fourth rib; cough loose; colour still bad. 19th: "Had a very bad night," "fighting for breath"; colour bad; note impaired below line of fissure; markedly dull above it, but no fluid resistance. Explored with negative result. Oxygen p.r.n. Mist. ammon. c. ether. 20th: Little better, had better night. Pulse, respirations, lung as before. Heart, no dilatation. Strychnine and oxygen discontinued. 21st: Child said to be in pain



Dotted line shows fall due to tepid sponging. × Fall due to phenazonum, gr. iii. Explored.

and restless. Nothing found to account for pain. Seems comfortable. Temp. 100° at noon; evening temp. 97°. Pulse 120, respirations 30; much stronger; colour good. 22nd: Note still impaired, but better; few creps. behind and bronchial breathing in front. Given mist. ipecac. ammon. 24th: Child well; a few fine, distant creps.; still slight impairment on right side.

Dr. Still[1] refers to a case in which the fever lasted 15 days; and Dr. Pye-Smith, in Clifford Allbutt's "System of Medicine" says it may last as long as 26 days. Tepid sponging was employed, as I was reluctant to leave the child with a high temperature in the absence of a nurse, in view of the possibility of it rising higher. Aspirin on two occasions gave the child definite relief, but had little effect on the temperature, whilst phenazonum, used once only, caused a fall which lasted three hours and gave marked relief. The heart was strong throughout the illness. The exploration was done to exclude a possible interlobar empyema, suggested by the bad colour of the child on April 18th and 19th and the frequent attacks of dyspnœa, though sweating was absent and the chart did not indicate pus. Osler's[2] statement that empyema should be suspected if the fever persisted beyond the tenth day encouraged the exploration. The pulse and respirations did not fall with the temperature. The child is now perfectly well, with normal pulse and respirations.

I am greatly indebted to the staff of the Fulham District Nursing Association, whose invaluable services to the poor make possible the home treatment of cases of this kind without diminishing the chances of recovery.

[1] The Commoner Disorders and Diseases of Childhood.
[2] Principles and Practice of Medicine.

ROYAL VISIT TO A MEDICAL SCHOOL.—H.R.H. Princess Mary paid an informal visit to the London (Royal Free Hospital) School of Medicine for Women (University of London), on July 1st. She was received by the Dean of the School, Dr. Louisa Aldrich-Blake, Dr. May Thorne, and Miss L. M. Brooks. The Princess made a complete tour of the building, and showed much interest in the arrangements made for the residence of students, and in their work before and after qualification.

Reviews and Notices of Books.

L'INFECTION BACILLAIRE ET LA TUBERCULOSE Chez l'Homme et chez les Animaux. By A. CALMETTE. Paris: Masson et Cie. 1920. With 31 text figures and 25 coloured plates. Pp. 620. Fr. 55.

WHETHER such a book as this is really necessary just now might be open to question; if it is a luxury it is a very nice one—and appropriately expensive. Roughly speaking, it contains all that the author thinks worth consideration about the tubercle bacillus and tuberculosis from the point of view of the laboratory worker and sanitarian; diagnosis by other than laboratory methods and treatment are not dealt with. Practical details are given fully in a useful way, and the large problems of infection and resistance are treated in a broad and eager spirit. The considered opinions of one who has been so much occupied with the subject will be received with respect. Some years since the author caused a stir by denying the importance of direct aerial infection of the lungs, and it is interesting to find that he still thinks that in the vast majority of cases infection is primarily lymphatic, the bacilli gaining entrance by the digestive tract and chiefly through the buccal, pharyngeal, and intestinal mucosa. He emphasises the point that ordinarily adult tuberculosis is greatly modified by the fact that its processes evolve in an individual already infected more or less and partly immunised, partly sensitised. He evidently thinks that quite enough fuss has been made about the distinction between human and bovine bacilli, and dismisses the question whether tuberculosis is catching or not with the simple truth that tuberculous infection is caused only by the tubercle bacillus. The final chapter gives an admirable summary of his outlook on prophylaxis. The whole point is, he says: 1. To control the dissemination of bacilli; the danger comes not only from those with manifest phthisis, but from all the host of people who, often without symptoms, are infected and intermittently excrete bacilli; every human or bovine who reacts to tuberculin is a possible source of evil. 2. To find some means of deliberately producing the resistance which is developed by the common small benign infections of childhood. The gospel is definite if not very surely founded in all its details; perhaps good gospels seldom are. English readers will miss any discussion of the relation between silica dust and pulmonary tuberculosis. Its practical importance has probably not yet been realised in France; but one would have liked to know what Calmette thought of the theoretical aspects of the question, especially of the explanation of the protective action of coal-dust, worked out experimentally by Mavrogordato,[1] which is among the most pregnant of recent discoveries in pulmonary and general pathology.

The book is very well printed on several sorts of paper. References to the literature are given in the most convenient way at the foot of the page; there is no index. It can be heartily commended to anyone interested in the subject, who will find in it a great mass of information and clear-cut, interesting opinions.

THE SYMPATHETIC NERVOUS SYSTEM IN DISEASE. By W. LANGDON BROWN, M.A., M.D., F.R.C.P., Physician with Charge of Out-patients, St. Bartholomew's Hospital, &c. London: Henry Frowde, and Hodder and Stoughton. 1920. Pp. 161. 10*s*. 6*d*.

Dr. Langdon Brown's book is an amplification of his Croonian Lectures, which have already appeared in the columns of THE LANCET. In it less attention is paid to the morphological details of the system than to its clinical symptomatology, and less, again, to a complete résumé of every symptom imaginable than to its behaviour in a few large nosological groups—viz., affections of the endocrine glands, of the digestive and circulatory systems, and glycosuria. In this fashion the beginner obtains a better conception of its function, and learns how to apply principles to other morbid conditions, the outcome of sympathetic disturbances.

The value of Dr. Langdon Brown's little volume consists as much in its suggestiveness as in the actual information it embodies. The chapter on the relation of the system to the endocrine glands contains much interesting clinical material in reference to so-called diabetes insipidus, and a suggestive hint on the pharmacological action of valerian, a drug which is persistently decried by that scorner of all drugs the pure psychotherapist. We wish that the author had devoted more space to the possible effect of psychogenic factors on the function of the sympathetic system, for he is fully alive to the importance of this, and, indeed, supplies various clinical instances. It is probable that the future will see more attention paid to the actual pathology and pathological physiology of sympathetic disturbances, and that their outcome in emotional symptoms will be approached, therapeutically, from below as well as from above.

MILITARY PSYCHIATRY IN PEACE AND WAR. By C. STANFORD READ, M.D., Physician, Fisherton House Mental Hospital, Salisbury; late Major, R.A.M.C., Officer in Charge of "D" Block, Royal Victoria Hospital, Netley. London: H. K. Lewis and Co. 1920. With two charts. Pp. 168. 10*s*. 6*d*.

BY being in charge of the well-known "D" block at Netley during much of the war Dr. Stanford Read enjoyed exceptional opportunities for the prosecution of statistical and other studies in connexion with war psychiatry, and these are embodied in an interesting manner in this monograph. It is based more particularly on the investigation of 3000 consecutive cases admitted during 1917. Without giving the complete table of classification the following percentages may be quoted: Dementia præcox, 20; manic-depressive insanity, 14·3; confusional states, 17·1; paranoia and varieties, 16·6; mental deficiency, 13; general paralysis, 4·7; alcoholic psychoses, 1·6; epileptic psychoses, 1·2. Dr. Stanford Read's general attitude is one of enthusiastic acceptance of a psychogenic origin for the majority of the psychoses. For him dementia præcox "results from a faulty adjustment of life's demands," and "disharmonies in sexual adaptations constitute themselves an integral part of the disorder"; the psychological basis of paranoiac states is "of a homosexual nature," and only thus can we understand why "the paranoid trend is so extremely common a reaction among the war psychoses"; the anxiety of manic-depressive cases is, in fact, fear of ungratified desire of a sexual nature; as for alcoholism, "there are good grounds for believing" that "unconscious homosexual activity is capable of stimulating the craving for alcohol." There is a frank tendency on the author's part to emphasise the psychical at the expense, we think, of the physical, even in regard to actual commotio cerebralis and the toxæmias of various kinds, due in part, no doubt, to the line in which his own medical interests lay, and to the atmosphere in which he found himself. If a patient has both malaria and a confusional state the psychologist, naturally, "spreads himself" on the latter; notwithstanding the intimate relation between emotions and internal secretions Dr. Stanford Read dismisses disturbances of the latter as of no ætiological importance.

We consider some of the most valuable work in the book is in connexion with the problems of the enlistment of the mentally unfit and of the improvement of the mental status of the soldier, and we welcome the sane and practical conclusions of the author thereanent. His commonsense attitude is excellently expressed in the following quotation: "If means were taken that soldiers could more freely vent grievances and feel that sympathy and understanding were given them, if personal worries could be aired and advice sought, and if as little as possible any rankling sense of injustice were allowed to exist by a deeper study of those who come in conflict with disciplinary law, many a mental disorder might be nipped in the bud." The volume concludes with a cogent plea for adequate instruction in practical psychology as a part of the medical curriculum.

[1] Journal of Hygiene, xvii., p. 439.

BODILY CHANGES IN PAIN, HUNGER, FEAR, AND RAGE.

An Account of Recent Researches into the Function of Emotional Excitement. By WALTER B. CANNON, M.D., B.C., Professor of Physiology in Harvard University. London and New York: D. Appleton and Co. 1920. Pp. 311. 15*s*.

THE physiologist has begun to tackle the problem of the emotions seriously and patiently. He, of all scientific workers, is most likely to be content with nothing less than experimental exactitude, and his interpretation of results is worth as much consideration as that of the psychologist. Everyone knows it is a long step from the neuronal simplicity of the dog to the complexity of man, but the applicability of data obtained in the laboratory to man is not thereby negatived. Professor Cannon's general thesis, amply sustained by experiment, is that in pain and other emotional excitement certain reflex bodily responses occur which are to be regarded as anticipatory of the instinctive acts that naturally follow. Further, a mechanism exists whereby the changes initiated in an anticipatory manner by emotional excitement are continued or augmented by the emotion itself. By way of illustration it may be stated that certain alimentary processes cease and energy-supply for other parts is set free; blood is shifted from the abdominal organs to those immediately essential to muscular exertion (lungs, heart, central nervous system); energy-giving sugar in the circulation is mobilised—and all of these visceral changes are directly serviceable in making the organism more effective in the violent display of energy which fear, or rage, or pain may involve. Thus these dominant emotions are expressed in activity of the sympathetic system, but the visceral changes are more or less alike, though the emotions giving rise to them are different. Now if anger, terror, pain, anxiety, joy, grief, or deep disgust have as accompaniment acceleration of the heart, inhibition of stomach and intestinal movement, contraction of blood-vessels, liberation of sugar, &c., it follows, in the author's opinion, that the James theory of the emotions cannot be maintained, for the subjective quality of the emotions undoubtedly varies, yet the visceral responses are more or less uniform. The suggestion is that the visceral changes contribute to the emotional complex, but do not constitute it, and that, with the possible exception of anger, emotions cannot be expressed, and, presumably, felt, without the aid of the cerebral hemispheres.

DIATHERMY.

By CLAUDE SABERTON, M.D. London: Cassell and Co. 1920. Pp. 138. 7*s*. 6*d*.

THIS book is divided into three parts. The first part commences with a short historical account of the evolution of diathermy. The principles on which high-frequency currents are obtained are then explained, and various models of diathermy apparatus and methods of applying the current to the body are described. The second part deals with the medical uses of diathermy. The diseases and symptoms for which this form of treatment is recommended are next considered, and the methods of its application discussed for diseases of the circulatory and nervous systems, fibrositis, scars and adhesions, and diseases of joints; and some notes are added on its use in cases of pulmonary tuberculosis, pleural effusion, and certain other affections. The third part of the book deals with the surgical uses of diathermy; the principles of the method are described and its advantages indicated. Mr. Herbert Frankling, of Harrogate, has added a description of his method of performing cauterisation, by diathermy, of papillomata of the bladder by the suprapubic route, and of carcinoma of the tongue.

This is the first inclusive work on diathermy by an English author. Dr. Saberton gives his own experience and refers to the work of several authors, quoting freely from the writings of others. The book will be read with interest by those who are experienced in treatment by diathermy, and will be of considerable use to others who are anxious to know more of the subject. The addition of diagrams would have assisted beginners to understand the complex diathermy machine, and the factors determining the depth to which coagulation extends in various tissues might with advantage have been more fully discussed. There are a few trivial slips; on p. 2, "Wertheim, Salomanson" should be "Wertheim Salomonson"; on p. 29 units of heat are given in "litres"; but the book is clearly written and well prepared, and there is a full bibliography.

GENITO-URINARY DISEASES.

Transactions of the Section on Genito-Urinary Diseases of the American Medical Association at the Sixty-seventh Annual Session, June, 1916. Chicago: American Medical Association Press. 1916. Pp. 350.

THIS volume consists of a collection of papers read before the American Medical Association. Each paper contains a report of original work carried out by the writer; many of these also have appended verbatim reports of the discussions which followed the reading of the paper. The papers are of interest in that they deal with the difficulties met with in the treatment and diagnosis of genito-urinary diseases. One of the more important of them emphasises the value of the Gradwohl test in the diagnosis of syphilis, comparing its accuracy with that of the Wassermann test; in the subsequent discussion it appears that all observers hold the view that it is the best test at present available. The post-operative complications of prostatectomy are gone into in several papers, and it is interesting to note that a number of operators are averse from the use of irrigation after the operation. The idea of collecting papers in this way is one which should be imitated.

LES INFECTIONS GANGRÉNEUSES DES MEMBRES CONSÉCUTIVES AUX PLAIES DE GUERRE.

By G. LARDENNOIS and J. BAUMEL. Paris: Masson et Cie. 1920. Pp. 248. Fr.12.

THE first few pages of the book are devoted to a brief historical account of the subject; then follow sections dealing with the ætiology, pathology, symptomatology, diagnosis, prognosis, and treatment of gas gangrene. The last 20 pages contain a valuable bibliography, wherein references to many of the more important publications on gas gangrene may be found. The section on ætiology contains a brief but accurate description of the *Vibrion septique*, *B. perfringens*, *B. œdematiens*, *B. bellonensis*, and *B. sporogenes*. The importance of mixed infections with other organisms, especially streptococci, is duly emphasised. The various factors predisposing to gas gangrene are also considered. In the section on symptomatology, certainly one of the best in the book, a good description is given of the initial signs and symptoms of gas gangrene, and the value of early diagnosis, followed by immediate treatment, is pointed out. The authors recognise the following types of gas gangrene: Gas gangrene proper, localised or spreading; toxic types accompanied by great swelling of the muscles or extensive œdema; and gaseous phlegmons, localised or diffuse.

Treatment is considered under two headings: preventive and curative. Under the first the authors pass in review the various ways in which wounds have been dealt with during the war. The description given is rather sketchy, and those methods which were discarded after a brief period of popularity could easily have been left out. Removal of the projectile and other foreign bodies and complete and methodical excision of the wound, followed by suture in suitable cases, is rightly recommended as the best way of avoiding gas gangrene. Excision of the infected area or amputation of the limb is the treatment advised for cases of established gangrene. A good account of the use of vaccines and specific sera is also given.

The book is mainly the outcome of the personal experience of the authors, but the work of others has also been freely drawn upon. It is to be welcomed as a useful addition to the literature of the subject.

HANDBOOK OF DISEASES OF THE NOSE, THROAT, AND EAR.

For Students and Practitioners. By W. S. SYME, M.D., F.R.F.P. & S. G., F.R.S.E., Surgeon to the Ear, Nose, and Throat Hospital, Glasgow; Extra-academical Lecturer on Diseases of the Throat and Nose, Glasgow University. Edinburgh: E. and S. Livingstone. 1920. Pp. 329. 9*s*.

THIS is an attempt to compress an adequate description of diseases of the nose, throat, and ear into a very small compass, and it is not particularly successful. The teaching is perfectly sound and shows evidence of wide clinical experience, but it does not afford the complete and concise statements which are required by the student for examination purposes; nor, on the other hand, does it give those hints and details of treatment which would be helpful to the practitioner. Thus, as one instance out of many, the article on epistaxis will not suffice for the student faced with a question on its causation, and will not be a guide to the doctor who has to treat the affection. The illustrations are few and not very helpful. In any subsequent edition Dr. Syme will be well advised to leave out altogether the perfunctory mention of rare affections to make room for fuller treatment of common diseases.

MICROSCOPY.

Third edition. By E. J. SPITTA. London: John Murray. 1920. Pp. 534. 25*s*.

OF the common instruments of medicine the microscope is perhaps the one least generally understood and most often wrongly used. The general tendency of students is to try to obtain the largest magnification of an image possible with the objectives and eye-pieces available. They seldom use the instrument in order to gain the maximum knowledge of the object studied, and even qualified medical men do not always use their microscopes intelligently. "Microscopy" teaches in simple language and with the aid of large numbers of diagrams and photographs the elementary laws of optics and the principles of instrument construction, and shows very clearly the limitations of the microscope as well as the methods by which the best possible image may be obtained. The book is not written for medical men alone, but it will be especially valuable to them. The third edition is revised and considerably enlarged. New sections of special interest are added, notably on the use of combinations specially designed for the study of large objects at low magnifications. The later developments of microscopy—for example, the use of short wave-length films for improving the resolving power of objectives of large numerical aperture—are not neglected.

The book is well produced, the plates being especially beautiful.

ERGEBNISSE DER GESAMTEN MEDIZIN.

By Professor Dr. TH. BRUGSCH. Erster Band. Berlin and Vienna: Urban and Schwarzenberg. 1920. Pp. 657+vi. M.180.

THE aim of this book is to provide a summary of the advances which take place in medicine year by year. The first volume covers a wide range of subjects, including gynæcology, radiology, nervous diseases, acute fevers, tropical diseases, and so forth. There are 25 chapters, each being a short monograph on the subject under discussion. The book differs from our *Medical Annual* in that no attempt is made to summarise all the important work of the year. It is not clear what system has been followed in the choice of the subjects. Infective diseases receive a generous share, respiratory diseases a very poor one. It is clear, however, that even a volume of more than 600 pages cannot contain all the new work in the whole realm of medicine, unless it be rigorously edited. The editing is, however, uneven. Some chapters contain a list of references to German work only; others give a more cosmopolitan list of French, English, and American publications, whilst in some instances—for example, the omission of Besredka's work in the chapter on Anaphylaxis—the absence of a bibliography gravely reduces the practical value of the book. Inability to obtain access to recent foreign work may be responsible for this apparent neglect.

It is manifestly impossible to review adequately a book dealing with such diverse material. Of the diseases to which the war has attracted interest, typhus fever receives a comprehensive monograph, with a page and a half of references; "five-day fever," which has figured so largely in German medical literature during the war, is dealt with, and the chapters on protozoal diseases discuss amœbæ, hæmorrhagic jaundice, and diseases of the intestine. There is also a lengthy review of the sunlight treatment of surgical tuberculosis, with numerous illustrations. The book is unbound and contains no subject index.

BACKWATERS OF LETHE.

By E. A. H. BARTON. London: H. K. Lewis and Co. 1920. Pp. 151. 5*s*.

THE serious student need not be alarmed by the unconventional title of this book and of some of its chapters, as the contents are for the most part orthodox. Dr. Barton has rescued from the stream of oblivion many things worth remembering by those who give anæsthetics. Under the title of "Arma Virumque Cano," he discusses the anæsthetist's qualifications and apparatus, while "shoals and rapids" covers a useful discussion of common difficulties and dangers. Good examples are given to illustrate the danger of too light and too deep narcotisation with chloroform. The author's favourite method is a succession of C.E., ethyl chloride, and ether carried out by means of an open mask and the inhaler of his own design, which includes a face-piece and circular metal pillar. With this apparatus Dr. Barton gives "open" ether, but the effects must surely differ in degree from those obtained with a perfectly open mask and a drop-bottle. Dr. Barton recommends morphine with atropine before ether and uses it more freely than do some of his colleagues. The author is evidently both enthusiastic and critical, and has collected in this book a number of wise judgments and opinions resulting from his extensive experience in a branch of practice to which too little attention has hitherto been given.

FOOD POISONING AND FOOD INFECTION.

By WILLIAM G. SAVAGE, B.Sc., M.D. Lond., D.P.H. Cambridge University Press. 1920. Pp. 247. 15*s*.

Dr. Savage does well to point out that few subjects are so often treated in text-books, both in a hackneyed and in an inaccurate fashion as food poisoning and food infections. The title "ptomaine poisoning" is still retained in some quarters years after it had been proved that it is both incorrect and misleading. The question was well summed up in a report to the Local Government Board for which Dr. Savage was chiefly responsible in 1913, when the medical officer of the Board, Sir Arthur Newsholme, wrote that the cases commonly known as "ptomaine poisoning" (products of food decomposition) are generally recognised to result from the presence in the food materials consumed of certain pathogenic organisms, which are either living and capable of active multiplication or which, although affected by the cooking, are, nevertheless, poisonous by means of the toxins contained in them. The term "bacterial food poisoning" thus came into being as more correctly describing this group of diseases. The public health services will heartily welcome this book, for, though a comparatively small volume, the author has included most, if not all, known causes of food poisoning. There are chapters dealing with chemical poisons in food, preservatives, foods inherently poisonous, food idiosyncrasy, and so forth. The book clears up many of the obscurities which have surrounded the subject, and a valuable sequel to Dr. Savage's careful studies will be found in the chapter on the prevention of food-poisoning outbreaks, and in the final chapter on methods of investigating such outbreaks. We have here a valuable adjuvant to public health administration.

THE LANCET.

LONDON: SATURDAY, JULY 10, 1920.

Medical Education and the Preliminary Sciences.

AT few, if any, of the Sections at the recent meeting of the British Medical Association was more important business transacted than at the Section of Medical Education. For, while in every other Section recent medical advances were being discussed along various divisions of our comprehensive work, and especially such advances as would prevent early disease in the community, in the Section of Education there was under debate how the class of men to carry on these large and responsible public tasks could best be educated. Professional knowledge serves little unless it can be transmitted to those who are to give practical effect to it. Sir CLIFFORD ALLBUTT, President of the Association, and Sir GEORGE NEWMAN, President of the Section of Education, alike indicated that the medical curriculum must be open to recurring revision, because on its scientific side we are dealing with ever progressive acquisitions of knowledge, while the environment in which this knowledge has to be applied is also ever changing, and particularly is changing in directions that must tend to make the activities of medicine more directly applicable to life at large. Such propositions are recognised as a commonplace by all society, while the fact that the existing medical curriculum in this country is without certain qualities necessary to train students to the best advantage is equally a commonplace with those who have studied the subject.

With this accepted information before them, and before their audience, five distinguished men delivered important speeches to the Section, and the substance of what they said will be found in our columns, while their full papers have been published in the Journal of the British Medical Association. The speeches of those who opened the discussion, as well as of those who joined in it, assumed that the revision of the medical curriculum, which is actually promised for an early date by the General Medical Council, will not lead to any time-extension of the course. But much pressure is being put, and legitimately put, upon the General Medical Council to give expression in the training of medical students to scientific and professional features which have hitherto been ignored, so that the dilemma is reached that, while by general consent the curriculum cannot be lengthened, many consider that it should include methods and directions of instruction which are now absent from it. It follows that the curriculum must be lightened at either end or both ends, so that the years spent in the medical school proper and in the wards, where the professional subjects, scientific and clinical, and the course of actual disease as it occurs in bulk, are studied, may not be trespassed upon either by the belated attention to the ancillary sciences or by the unnecessary intrusion of specialism. The tenour of the debate before the Section of Education revealed no dissent from the view that the professional period of medical study must be as uncomplicated as possible, if the medical student is to cover the course and obtain qualifications in any time like five years. The different speakers directed themselves towards explaining what they considered should be the relation of the sciences of chemistry, physics, and biology to the after events of the medical curriculum, in order that this preliminary scientific education, instead of being the industrious or idle cram that it often has been, should become the basis of the student's thoughts; so that throughout the study of the professional subjects scientific accomplishment and bias should assist the student at every turn in his acquisition of pathology and technique. From their words the ideal of early training in science emerged: namely, that it should be clear—and this postulates the good general education of the recipient—practically interesting, and formative. It should not lead to the detailing for examinations of so many boys in so many months knowing so many things in accordance with a syllabus; it should mean the sound preparation, by intelligent instruction in the essentials, of students who will be able to use what they have learned generally, in its special applications to all that may follow. Thus the philosophical conception of the pure sciences will arrive, and will be infused in the pathological work, giving intensive meaning to that work while also clarifying it.

It is clear that if the curriculum is to be strengthened without being lengthened, and simplified without being lowered in standard, the whole of the five years required by the State from the student must be used with the greatest economy. Having always in our eye the average student, we must admit that this can only be done if these five years are kept as clear as possible from the invasions of the unnecessary, while the students themselves must be sufficiently well educated to take full advantage of the opportunities for learning what is necessary. Their own time and the time of their teachers must not be wasted by finding in every class lads whose equipment does not fit them to understand the necessary courses of instruction. Every medical student to-day requires a good general preliminary education, and it is what a great many do not receive. Here is one definite thing which those who revise the curriculum must see to, for until this first impediment is removed early instruction in science is unduly hard, both for the pupils and the masters. If the students could come to their medical studies proper, whether at the medical school or under a University faculty, ready to attack anatomy and physiology, and having behind them an adequate training in chemistry, physics, and biology, the work to be done in the statutory five years would be enormously lightened. Can this substantial alteration in the curriculum, which has been proposed in different shapes for many years, be justified, implying, as it does, the use of the last year of schoolboy life, and perhaps even of two years, in preparing for medical studies proper? The General Medical Council may be inclined to solve the embarrassment of the overloaded curriculum in this way, but the proceedings in the Section of Education showed that such a solution, while expected, will be attended with many complications. There is at present in existence no large number of schools where the student can acquire that really practical knowledge of chemistry and physics which later should inspire and foster the whole of his medical work, and this we hold strongly should occur; while in the case of biology it is admitted that adequate training is offered by hardly any of the secondary schools. A practical

beginning in the revision of the curriculum—the improvement of general education being taken for granted—would be to leave chemistry and physics as schoolboy subjects, retaining biology as part of the medical course proper; and it would be understood that the lessons learned by the schoolboy in physics and chemistry would be called upon, and his knowledge in these directions developed by continuation study in connexion with his professional subjects. The suggestion has this practical force behind it that chemistry and physics are the groundwork of all scientific education, and whatever the schoolboy who intends to make his career dependent upon scientific knowledge may elect to do, complete familiarity with these sciences will be required of him. Biology is to this extent different, that it forms a definite introduction to the pursuit of medicine. A resolution embodying this change in the curriculum was set down at the Section of Education, and will be brought to the notice of the Education Committee of the General Medical Council.

The Wassermann Reaction.

THE complement-fixation test in syphilis has proved, and is likely for some time to prove, of more far-reaching importance than its discoverers can have imagined. When WASSERMANN, NEISSER, and BRUCK in 1906 published the fact that the complement-fixation test could be applied in syphilis there was no reason why they should not have regarded it merely as a special application of the Bordet-Gengou reaction, in which complement was used up in the interaction of specific antigen with its specific antibody. From the standpoint of diagnosis in syphilis Wassermann's reaction has amply fulfilled the expectations of its originators. How accurate it has become in the hands of expert workers was shown in a recent Report issued by the Medical Research Council (Special Report Series, No. 21) recording an experimental trial, in which more than 100 sera from cases of known syphilitic or non-syphilitic nature were examined by three separate workers of repute, with results which were astonishing in their concordance with one another and with the known clinical facts. The test, as all our readers know, has become a routine part of diagnosis, and there is no need to enter here into any discussion of its merits from this point of view. The only doubtful questions concern the precise manner in which it is best carried out. But there is another and much wider aspect opened out by Wassermann's reaction, one that in the long run may, we think, prove of even greater importance than the mere diagnosis of a specific disease. The grounds on which WASSERMANN and his colleagues based their experiments were rigidly scientific. In accordance with the observations of BORDET and GENGOU, they deemed it necessary to use as antigen an extract of syphilitic liver, and they assumed that a positive reaction meant the presence of specific antibody in the blood of the patient. But it was soon found that the specific antigen was unnecessary. An alcoholic extract of normal liver or heart, even from a guinea-pig, was found to serve just as well, and, indeed, solutions of known chemical composition—e.g., of lecithin and cholesterin—were proved capable of acting as antigen, and this without any impairment of the diagnostic value of the test. We know of no other instance in which a reaction of this sort has suffered the wreck of its assumed scientific basis and become a frankly empirical test without at the same time being proved invalid. It was not to be supposed that scientific men would tolerate such a shock to their principles, and it became necessary to search for other scientific grounds on which to base an explanation of the phenomenon. The bio-chemists have been at work, and for the first time in the history of immunology it seems possible that an intimate serological problem may ultimately receive a physico-chemical explanation. We are, doubtless, a long way from this at present, but much has been already accomplished, and if study of the Wassermann reaction should lead to so happy a result the test will acquire a significance far transcending that of its diagnostic value.

We have been prompted to these remarks by the receipt from the Ministry of Health of a Report on the Complement-fixation Test in Syphilis,[1] which merits the careful attention of those of our readers who are interested in the scientific side of serological problems. From the nature of the subject it is not light reading; much of it, indeed, is difficult reading, save for the expert, as we doubt not it was difficult writing. But it contains a large amount of patient and valuable research and of deep and original criticism. In a short introduction Colonel L. W. HARRISON explains the origin of the work contained in the Report. It was a scheme, interrupted by the war, for a prolonged research into the properties of the various ingredients in the Wassermann test in order to improve, if possible, the technique of the reaction. The work has been carried out by Dr. F. GRIFFITH and Dr. W. M. SCOTT at the laboratories of the Ministry of Health, under the general superintendence and advice of Colonel HARRISON. It has been proceeding since July, 1917, and the Report by Dr. GRIFFITH and Dr. SCOTT contains a mass of valuable observations which, in their opinion, suggest certain improvements in the method of carrying out the Wassermann test. As everyone is aware, most persons react to the test in a frankly positive or negative manner which admits of no cavil. The difficulties arise in the so-called border-line cases, in which the reaction is a weak one. There is in normal sera a small but variable amount of the substance, or property, which reacts with the antigen, and the problem is so to balance the ingredients in the test as to exclude these, while making the test sufficiently delicate to detect real syphilitics. This cannot, of course, be done absolutely, but all techniques have as their aim as close an approach to this ideal as can be achieved. As a result of their work Dr. GRIFFITH and Dr. SCOTT put forward a technique, which is supported in detail by their experiments, and of which the two chief principles are: (1) A very highly diluted antigen, consisting of the acetone-insoluble fraction of the organ-lipoids dissolved in alcohol, to which is added a suitable dose of cholesterin; for use, the alcoholic solution is rapidly diluted with normal saline to 1 in 640. (2) The second principle consists in prolonged fixation in the ice chest for 18 hours, instead of at room temperature or 37° C. This is an application of the observations of DEAN and of SMITH and MACNEAL. A further principle adopted is that of maximum sensitisation of the corpuscles, with only a moderate dose of complement, which is kept constant. The method

[1] Reports on Public Health and Medical Subjects. No. 1. 1920. Price 5s.

is favourably reviewed by Colonel HARRISON in his introduction, but space forbids our entering into further discussion of it here. The remaining and longer portion of the Report is occupied by a critical review of the principles involved in the Wassermann test by Dr. ARTHUR EASTWOOD. Only those who have attempted to grapple with the vast literature which has sprung up on this subject, and know its highly technical and controversial nature, can appreciate what Dr. EASTWOOD has done in preparing this review, which is probably the most impartial, as it is the most complete, in the English language. It is divided into two parts, the first dealing with "Complement," and the second with the so-called "Wassermann Substance." The writer does not attempt to put forward any theories of his own; his work lies in a candid statement of the various points at issue, with the answers propounded by the different workers who have written about them, the evidence being given in each instance and its validity critically considered. At the present day no final answers are possible, and the method adopted by Dr. EASTWOOD is clearly the best and most useful which he could have chosen. All serological workers will owe him a debt of gratitude for the conscientious way in which he has performed a laborious task, and for the critical acumen which he has brought to bear upon it. Anyone who is in search of a subject for original research will find abundant suggestions here.

We should like to be allowed, in conclusion, to congratulate the Ministry of Health on this the first report of the kind which it has issued, and to express the hope that it may be succeeded by many others of equal value and importance. Work on such lines is precisely that which can best be carried out in the laboratories of a Government institution. We noted the other day in the public press a singularly ill-informed outcry of "waste," because Reports on the Wassermann test had been published by two separate Government departments. The particular piece of research recorded in the present Report was not only carried out, as will be understood from Colonel HARRISON'S introduction, with the full knowledge of the Medical Research Council, but was designed to fill certain gaps in knowledge which the Reports of that Council had emphasised. It was evidently carried out in the laboratories of the Ministry of Health because it could be done better and more economically there than elsewhere.

The Position of General Practice.

Dr. PETER MACDONALD, of York, described the debate on the future of medical practice, held by the British Medical Association at Cambridge on Friday of last week, as one of the most valuable ever instituted by any medical body. Probably it was one of the most enlightening. For no doubt many general practitioners came to it with grave misgiving as to the part which the State is preparing to take in moulding the outward form and conditions of medical practice, and were reassured by the emphatic utterance of the Chief Medical Officer of the Ministry of Health, "Nationalisation of the medical profession—it simply cannot be done." Sir GEORGE NEWMAN went on to speak of the action of the State in continuing to pile up duties—under Public Health, Education, Mental Deficiency, Children, Midwives, and other Acts—on a doctor who can never be organised in any strict sense, on a profession the whole genius of which is individualistic. Although safeguarding his Department by assuring his audience that he was speaking wholly in an unofficial capacity, it yet seems quite clear that so long as Sir GEORGE NEWMAN is principal medical adviser to the Ministry of Health and to the Board of Education nothing will be done to abolish the personal relations now existing between the general practitioner and his patient. Behind these relations lie a long history and sound reason.

But some change there must be, for it is clear that the two contracting parties, the State and the medical profession, cannot be allowed to drift into a position of misunderstanding. The State has become conscious, as never before, of the community's need of the medical profession, and the medical profession is aware of new obligations, not merely those imposed by statute, but others, the result of social and economic factors hitherto regarded as scarcely coming within the range of medicine. Adjustments are needed, and in many ways a closer relation between the State and the general practitioner, who should maintain nevertheless all that is of permanent value in his relation to his patient. Dr. ALFRED LINNELL, speaking in the discussion from the standpoint of that most general of all general practitioners, the man in rural practice, regarded the primary health centre as the pivot around which the new medicine is to turn. Provided with greater facilities to study and find out the beginnings of disease, and to treat them efficiently when discovered, and paid well enough so as to have no need to rush his work, the general practitioner in these circumstances will remain not only the essential humaniser in medicine, but, as he already is, the chief agent of preventive medicine. The growing disposition at the Ministry of Health to take the general practitioner by the hand and help him in his work was acknowledged in the discussion.

The debate was necessarily scrappy. Five medical men, moving in five distinguished spheres of medical endeavour, were prepared with addresses, each on a special aspect of the subject, and each contributor was heavily weighted with new thoughts and ideas. Sir GEORGE NEWMAN spoke for the State, Sir WILMOT HERRINGHAM for the consultant, Dr. LINNELL for the rural practitioner, Professor F. GOWLAND HOPKINS for medical research, Mr. E. W. MORRIS for the hospitals from their institutional aspect. It would take much ingenuity to dovetail all that was said into a workable scheme. But none of the speakers had any thought of abolishing general practice or of altering in any essential way the relation of practitioner to patient. Only Mr. Alderman JENKINS, the Secretary to the Health Committee of the Labour Party, spoke of a State service, but then in the same breath he indicated that he did not desire to see medical men "civil servants in the sense in which we think of them." The medical service which he had in mind would study the conditions under which workers live and work, and would educate them in the safeguarding of their health. That is what we should all like to see. The outstanding message of this debate is that general practice, extended and sublimated, remains for our generation upon its long-tried and noble plan; it remains as a career for the brightest and best of students to enter.

Annotations.

"Ne quid nimis."

INTERNATIONAL PUBLIC HEALTH.

THE Medical Advisory Board of the League of Red Cross Societies is holding its first meeting at Geneva this week. We enumerated its 15 members in our issue of June 5th and need only repeat here that the representatives from this country are Colonel S. Lyle Cummins, Sir Walter Fletcher, and Sir George Newman, and that the other delegates are equally distinguished. The public health problems of Asia and Africa have heretofore often appeared immense and baffling; it is now the health of Europe which is the white man's most pressing burden, and the attention of a continent will be concentrated on the deliberations going on by the side of Lac Léman. The opportune moment has been utilised for the appearance of the first number of the *International Journal of Public Health*, published bi-monthly by the League in four editions—English, French, Italian, and Spanish. Dr. Thomas R. Brown is the editor, with a staff of one associate and six assistant editors under him. The first three numbers are to be issued gratis in all parts of the world, and with the fourth issue in January, 1921, a subscription rate of 20*s*., or its equivalent of 5 dollars, 25 francs or lire, will be instituted. The scope of the journal is apparent when it is noted that this pioneer number includes as its first original article an essay by Professor A. Calmette on the protection of mankind against tuberculosis, part of a report by Dr. Richard P. Strong on the antityphus campaign in its bearing on Poland, and a sketch by Dr. George C. Whipple of the possibilities of world sanitation in the twentieth century. The contributions contain brave words which need bold administrators to carry them out.

THE MENTALITY OF JUVENILE ADULT DELINQUENTS.

THE problem of the connexion between criminality and mental deficiency bristles with difficulties whatever be the aspect, social, legal, or medical, from which it is approached. Reports, both of expert individuals and of commissions appointed to deal with the subject, are at the disposal of those who seek general principles for application in practice, but no definite body of doctrine is yet available nor is likely to be until more data have been collected. The general trend of opinion to-day is setting towards the indispensability of psychophysical examination of each individual delinquent, an attitude preferable to any sentimentality or unthinking humanitarianism on the one hand, or to the unvarying application of an inelastic legal "yes-or-no" criterion of insanity or mental deficiency on the other. The youthful offender may look like an angel and act like a demon, but neither looks nor acts suffice for a diagnosis. In the case of the adult, pilfering or thieving may be the expression of definite organic conditions, such as early general paralysis, alcoholism, or morphinism, as well as the outcome of moral or mental deficiency unaccompanied by any obvious structural or toxic change; there is evidence to suggest that in the case of women kleptomanic outbreaks are frequently associated with the menstrual or premenstrual period, and Glueck has recorded a case in a male where theft seemed to be a form of perverse sexual gratification. Persistent lying, similarly, in the form of pseudologia fantastica, may be a symptom of actual cerebral disorder, no less than one of the phenomena by which the criminal evidences his antisocial outlook.

If, then, it is granted that individual symptoms customarily regarded as of a pronounced antisocial cast may be ascribed on occasion to structural or toxic disease, we are bound in any assessment of criminality to take cognisance of the subject's physical and psychical make-up, a matter not to be decided by a brief interview with the criminal, but necessitating a prolonged, tedious, and painstaking investigation. To assign criminal traits to heredity or to environment is too ready-made a solution to be of value. Dr. John M. Ahern, medical officer to the Borstal Institution, records elsewhere in this issue the results of an inquiry into the mentality of the inmates of that reformatory, conducted during February and March of this year, an inquiry of the kind which is essential if any progress is to be made. Only some 10 per cent. of the 928 juvenile adult delinquents came under the category of the mental defective, though Dr. Ahern considers this a very conservative estimate, ignoring as it does borderline cases and slighter yet unmistakable degrees of mental deficiency. Intellectual defect is probably of least significance in connexion with the criminal propensities of the subject; degree of criminality and level of intellectual attainment show no correspondence, for the village idiot, Dr. Ahern reminds us, may be amiable and inoffensive. It is a nice point, however, whether intelligence and intellectual attainment are strictly synonymous. The actions of many criminals show a high order of cleverness yet but a low order of intelligence, for the latter connotes the ability to apply knowledge and to profit in the school of experience. Now Dr. Ahern makes the shrewd observation that continued misconduct, if it be of a purposeless character, is always suggestive of mental defect; the habitual offender is dull to his own interests, however brilliant a rebel he may fancy himself; he has not the wit to appreciate the strong inducements to good conduct that are to be found in a Borstal institution. The same is true, doubtless, of the adult criminal; a career of crime implies inability to realise the inevitable consequences.

It is difficult, in a way, to separate the emotional from the intellectual factor in mental defect associated with criminal tendencies, since emotional outbursts may have their origin, as Dr. Ahern says, in some idea of "getting one's own back." Unreasoning, meaningless, emotional overflow may fairly be regarded in some instances as an epileptic equivalent, and this is especially true of violent temper, which has been shown statistically to be frequent in epileptic families. In other cases the emotionally unstable are plausible, well-spoken, generous, and of good behaviour under rigid supervision, and there are great differences in the way in which the defect is manifested, with corresponding difficulty when it comes to the question of certification. It might be supposed, legitimately enough, that the physiological disturbances of adolescence will account, in part at least, for the emotional instability of the youthful delinquent, and that with the establishment of neuro-glandular equilibrium emotional balance will likewise be attained, but too much reliance can be placed on this hope. Many criminals remain at the level of children as far as their affective life is concerned; they become the catspaws of stronger minds than their own. All observers are agreed on the seriousness of the problem presented by their treatment, institutional or otherwise. If their general level of intelligence is fair, as is often the case, it should be possible, in some instances, to strengthen control by suitable psychological re-education, and in others glandular therapy, where indicated, might well be given a trial. No line of therapeutic approach should be vetoed because of mere novelty or frank empiricism, as long, that is, as there is evidence of actual psycho-physical imperfection. In any case, the results obtained by the Borstal system indicate that for very many youthful criminals who are not too much below par mentally and physically the outlook is hopeful enough, provided medico-psychological investigation and treatment are given as ample chances as the nature of the human material demands.

MEDICAL SECRECY IN FRENCH LAW.

A CASE has just been heard on appeal in a French higher court which raised very pointedly some of the questions of professional secrecy so closely discussed at the Representative Meeting of the British Medical Association. The Eighth Chamber of the Paris Court of Appeal was asked to decide on the right to produce in court a confidential medical certificate.

A certain Monsieur X appealed for a divorce from his wife, producing in support of his action a doctor's certificate on which his lawyer laid great stress. The Court of Second Instance as well as that of First Instance decided to disregard this certificate, since professional secrecy did not allow a doctor, without the patient's knowledge and consent, to deliver a medical certificate to a third person, even should that person be her husband. The production of the certificate was held by the court to be a serious injury, and the suit was decided in the wife's favour. The decision confirms once again the legal position long ruling in France. For a doctor to supply a certificate containing facts, of which he has only come to a knowledge in professional circumstances, constitutes a lapse from the duty of discretion imposed upon him by law. No such certificate is admissible as evidence in a French court of law.

EPSOM COLLEGE.

Epsom College is passing through a period of financial stress which is a source of anxiety to its promoters and of obstruction to the smooth working of the institution. The annual report of the Council presented to the governors on June 25th shows a deficit of £4425 incurred during the year 1919. This is accounted for mainly by the need for extensive repairs, which had accumulated during the war, by the higher salaries paid to masters and officials, and by increased establishment and catering charges. Some of the additional expenses will be met in the future out of increased school fees payable from next September. Sons of medical men will then have to pay 100 guineas, others 120 guineas, and day boys 40 guineas, against the former charges of 70, 80, and 25 guineas. The sum of £6000 will shortly have to be repaid to the mortgagees, while interest on the remaining £8000 of the mortgage must be raised from 4½ to 5 per cent. In view of all these facts the Council has decided to create mortgage debenture bonds of £100 each on the security of the College lands and buildings, in order to pay off both mortgage and banker's loan. Friends of the College are asked to take up these bonds. The double purpose of assisting in the provision of a public school education to sons of medical men at reduced fees, and of affording financial support to necessitous doctors, their widows and families, should commend itself to all members of the profession. The war record of old Epsomians and masters—to be memorialised in a reconstructed nave to the chapel, for which the fund is not yet closed—is sufficiently distinguished to add to the school's claim for turning out the right sort of men, and its present needs appear modest enough to command a speedy release from embarrassment.

THE TREATMENT OF ACUTE INFECTION OF THE KNEE-JOINT BY ACTIVE MOVEMENT.

"Everything that is universally accepted as true in surgery is invariably false." These are not, as might be supposed, the words of one of the caustic critics of our art, whom, from Molière to Bernard Shaw, we have always with us, but of one of its greatest exponents. They refer to the accepted treatment of tuberculous, rheumatoid, and other forms of arthritis by rest, which Sir W. Arbuthnot Lane stated recently in our columns[1] can often be benefited by allowing active movement, if sufficient extension can be exerted to take pressure off the opposing articular surfaces. During the war a Belgian surgeon, Dr. C. Willems, Director of the Hoogstade Military Hospital, had the courage to go even further and treat acute arthritis, principally of the knee, due to infected bullet wounds, by incision and drainage, followed by immediate active movement. The movement expelled pus and prevented adhesions, and the results were excellent. In the *Boston Medical and Surgical Journal* Dr. F. B. Lund has reported the following case treated by this method. A man, aged 43 years, received a bullet wound in the right popliteal space on Dec. 7th, 1919. The X rays showed a flattened bullet in the back of the knee-joint. On Dec. 11th the temperature was 100° F., the skin was reddened, and there was evidence of fluid in the knee-joint. On the 12th a 1½-inch incision was made on either side of the patella, and a large amount of seropurulent fluid escaped. A 3-inch incision was made in the middle of the popliteal space, and the dissection carried down to the inner side of the popliteal vessels. After considerable difficulty the bullet was found in the capsular ligament projecting into the knee-joint. A rubber tissue drain was placed in the popliteal space and a dry dressing applied. Active movement was begun next day. The patient coöperated very well and was proud of the amount of movement of his damaged leg. The movement was regularly continued daily, the temperature rising gradually until on Jan. 3rd a collection of pus in the upper part of the popliteal incision was drained by insertion of forceps and a rubber tube was inserted. On Jan. 9th another pocket of pus was opened. At this time active movement was not so free as it had been on account of swelling and tenderness in the popliteal space. The Carrel-Dakin treatment was then adopted and the amount of pus diminished. Active movement was continued, but not to the same extent, and on April 1st he was up on crutches with 45° of flexion and perfect extension. He was discharged with perfect movement of the joint. Of the value of the active movement there could be no doubt, though recovery was delayed by the complication of abscess in the popliteal space. Considering the permanent stiffness of the knee-joint which usually follows suppuration the recovery was remarkable. In the *Annals of Surgery* for September, 1919, McWilliams and Hetzel state that in 73 cases of war wounds of the knee-joint 16 became infected. Of 12 of these, in which the final result is known, amputation was performed in 3, resection in 1, 4 resulted in ankylosis, and 4 were fatal. These cases were treated by the old methods. The writers believe that the treatment of Willems would have given much better results. In 100 cases, of which 18 were accompanied by purulent synovitis of a virulent type, chiefly streptococcal, he had no deaths and no amputations. There was 1 resection and only 2 stiff joints.

[1] THE LANCET, May 29th, p. 1159.

FINANCIAL DIFFICULTIES OF IRISH HOSPITALS.

IN our last issue reference was made to the serious financial position of the Royal Victoria Hospital, Belfast. Our Irish correspondent now writes: I am glad to be able to state that on July 1st at a meeting of the Working Men's Committee held in that institution it was decided that as 1*d.* weekly was no longer an adequate contribution from the employees the amount in future should be at least 2*d.* a week from men and 1*d.* from women, girls, and boys. It was also passed to ask employers to deduct workers' subscriptions from their wages. It remains for the employers now to follow the example set by their workers. At present interest from investments supported 56 beds; general subscriptions from manufacturers, the Hospital Saturday collections and charitable donations maintained 65 beds; and the working classes' subscriptions 96 beds. The latter had increased from £5076 in 1915 to £12,500 in 1919, and it is needed that they should further grow to £20,000. The total cost of the institution had increased from £14,741 in 1914 to £38,409 last year, the principal items being: dietary, £5000 to £14,000; nurses' salaries, £13,038 to £24,078; ordinary salaries, £2014 to £4060; medical and surgical requisitions, £2400 to £4844. The extra wards brought into use during the war now cost an additional £12,000 a year. The Maternity Hospital, Belfast, the main training institution in that city for students and midwives, is also experiencing financial difficulties, due to increased cost of almost everything. As, according to the estimate of the Ministry of Health, there should be one maternity bed per 2000 population, Belfast on this ratio should have 250 beds; it has, however, only 70; and if a line be drawn across Ireland from Dublin to Galway, Belfast is the only place north of this line that has any maternity institutions except in workhouses, some of which are admirable,

and are recognised both by the Central Midwives Board for Ireland and by the Queen's University of Belfast as places where both midwives and medical students may obtain practical training.

A report by Sir Francis Champneys just published, dealing with the answers received from a large number of medical schools on practical midwifery, and presented to the General Medical Council at its last sittings, runs thus: "The immediate provision of beds in sufficient number to supply the needs of our medical students is probably impossible. The utilisation of beds in Poor-law institutions might help." The Education Committee recommended that steps may be taken for the utilisation of existing Poor-law lying-in institutions for clinical instruction. This wise suggestion was adopted by the General Medical Council so far as England and Scotland were concerned, but was omitted in the case of Ireland; and now it is found such an omission would not be justified. Only this week, at the clinical practical examinations in midwifery of the Queen's University of Belfast, a large batch of students were examined at the very commodious Maternity Hospital of the Union Workhouse, Belfast; and without this place (owing to the large number of students for the M.B. Final Examination—66 in all) a number could not have been examined practically. The sooner omission of Ireland from the suitable recommendation of the Education Committee of the General Medical Council is abrogated the better in the interest of both medical students and midwives. It is all very fine to talk of the stigma of Poor-law institutions, but what is yet supplied to replace them? The unusual number of medical students and of pupil midwives must be provided with practical midwifery instruction in the present emergency, and, to do so, workhouse lying-in wards are urgently required in Ireland, and must be made available as in England and Scotland.

SOLUTIONS FOR INTRAVENOUS INJECTION.

THE Medical Research Council have arranged to place on the market sterilised solutions of gum acacia like those extensively used in military hospitals during the war in the treatment of hæmorrhage and shock. It is believed that the experience of the war will have created a demand for these solutions for the purposes of civil surgery, but that many hospitals have been unable to undertake the manufacture of the solutions in their own laboratories. The solutions are made according to the method employed during the war at the Base Hygiene Laboratory, B.E.F., as described in the Medical Research Council's Special Report, No. 25. They are made up in special stoppered bottles containing 500 c.cm., and are sold at the price of 1*s.* 6*d.* per bottle, plus a charge for transport; 6*d.* is also charged for each bottle not returned when empty. All inquiries should be addressed to Messrs. Evans, Sons, Lescher and Webb, Ltd., at the Bacteriological Research Laboratories, Runcorn.

MYCOTIC OTITIS.

ACCORDING to Dr. C. J. Koenig,[1] oto-rhino-laryngologist to the American Hospital of Paris, mycotic otitis, though well known, is not of very frequent occurrence. He records a case in a woman, aged 27, with cicatrised pulmonary lesions supposed to be of tuberculous origin, who had been treated for eczema of the right external auditory meatus, followed by tinnitus, itching, and deafness. On inspection the meatus was found to be full of greyish masses of what appeared to be macerated epithelial debris, on removal of which the drum was seen to be perforated at its antero-inferior segment. After treatment by catheterisation of the Eustachian tube, syringing the meatus, and instillation of alcohol and peroxide, the perforation closed, the canal became normal, and the hearing returned. As the symptoms recurred within a few weeks on two subsequent occasions the greyish masses which had been taken for macerated epithelium were examined and found to be intricate meshes of mycelium containing spores. Cultures of the ear on Sabouraud's medium showed a typical growth of *Aspergillus niger*, which of all inferior moulds is the one which develops most frequently in the external auditory meatus. Dr. Koenig suggests that the previous affection of the lung was not due to tuberculosis, as had been supposed, but to aspergillosis, inasmuch as pulmonary mycosis is apt to simulate tuberculosis, and the sputum in such cases shows acid-fast bacillary forms resembling Koch's bacilli.

[1] Medical Record, June 5th, 1920.

EMERGENCY DISTRIBUTION TO LONDON HOSPITALS.

THE Hospital Fund for London, associated with the name of King Edward, has just distributed £250,000 to meet the immediate and pressing needs of the London hospitals. The grants are made with the express object of assisting the hospitals to carry on their work, and in the hope that where special difficulty is being found in raising funds for maintenance, the grant may afford the hospital authorities an opportunity of considering the best methods for improving their financial position. The grants are from £25 upwards, in accordance with the size of the hospitals and the special circumstances of their needs. Those of £1000 or over are as follow:—

Bolingbroke Hospital, £1500; Charing Cross Hospital, £2100; City of London Hospital for Diseases of the Chest (Victoria Park), £3000; Dreadnought Hospital, £1000; East London Hospital for Children, £3000; Elizabeth Garrett Anderson Hospital, £1250; Great Northern Central Hospital, £12,000; Guy's Hospital, £7000; Hampstead General and North-West London Hospital, £2000; Hospital for Consumption, (Brompton (including Sanatorium at Frimley), £3000; Hospital for Epilepsy and Paralysis, £1200; Hospital for Sick Children (Great Ormond-street), £8000; Hospital for Women (Soho-square), £2000; King's College Hospital, £17,500; London Homœopathic Hospital, £3500; London Hospital, £35,000; London Lock Hospital, £1000; London Temperance Hospital, £3500; Metropolitan Hospital, £11,000; Middlesex Hospital, £10,000; Miller General Hospital for South-East London, £4000; National Hospital for the Paralysed and Epileptic, £8000; Passmore Edwards Hospital for Willesden, £1000; Prince of Wales's General Hospital, £7000; Queen Charlotte's Lying-in Hospital, £2000; Queen Mary's Hospital for the East End, incorporating West Ham and Eastern General Hospital, £6000; Queen's Hospital for Children, £6500; Royal Chest Hospital (City-road), £1000; Royal Free Hospital, £6000; Royal London Ophthalmic Hospital, £3000; Royal National Orthopædic Hospital, £2000; Royal Waterloo Hospital for Children and Women, £2000; St. George's Hospital, £8500; St. Mary's Hospital, £2000; St. Mary's Hospital for Women and Children, Plaistow, £1500; St. Thomas's Hospital, £12,000; Samaritan Free Hospital for Women, £1500; University College Hospital, £10,000; Victoria Hospital for Children, £1500; West London Hospital, £9500; Wesminster Hospital, £9500; the remaining grants to 64 smaller hospitals totalling another £18,000.

In allotting the grant the Council of the Fund is asking each hospital to consider whether its income can, without detriment, be increased by taking some special steps—e.g., by the organisation of contributions from employers or from employed, or from patients who can afford to pay, or by other methods; and at the same time to take whatever steps may be necessary and practicable to keep the expenditure within the available or prospective income—e.g., by postponing bed extensions and by exercising more stringent control over cost of working.

PURPURA ANNULARIS TELANGIECTODES.

ACCORDING to Dr. Ludwig Weiss,[1] of New York, who records two examples with the biopsy findings in one case, this condition was first described by Majocchi in 1896. It is characterised by grouped or annular lesions, associated with pigmentation or discoloration and no thickening, but a tendency to atrophy. Three stages in the disease may be distinguished—a telangiectatic, a hæmorrhagic-pigmentary, and an atrophic. There are no inflammation, pain, fever, or other constitutional symptoms observable as in other purpuric conditions. As regards the ætiology of the affection, almost all diatheses have been suspected, only to be

[1] The Archives of Dermatology and Syphilis, May, 1920.

excluded, such as tuberculosis, syphilis, rheumatism, gout, diabetes, heart disease, hæmophilia, and lead poisoning. Out of 38 cases collected by Mackee in 1915, 31 occurred in the male sex. Auto-intoxication is regarded by most authorities as the causative agent, but until this is definitely established the treatment can be only symptomatic. Rest and an elevated position of the limb, with the use of embrocations of Burow's solution, will prove useful. Calcium lactate may be given to increase the viscosity of the blood, and later strychnine and arsenic should be administered. The use of a porous bandage without rubber, to exert an even pressure, has also been recommended.

THE HOSPITAL SURVEY.

Sir Napier Burnett has now presented to the Red Cross Joint Council a survey of the financial position of the voluntary hospitals throughout Great Britain and Ireland for the five-year period 1914–19. His inquiry was directed to ascertaining the total amount of ordinary income and expenditure for each of these years, along with the total value of legacies not earmarked for specific purposes. The conclusions to which he comes, stated baldly, are that the voluntary hospitals in this country, taken as a whole, are solvent; that there is a deficit on the five years running of about a quarter of a million pounds for the provincial hospitals (and a similar sum in London); and that a further sum of three-quarters of a million is required to meet the accumulated cost of repairs and necessary alterations in both metropolitan and provincial hospitals. A covering letter from Sir Arthur Stanley states that if the voluntary system is to continue, five things are necessary:—

(1) Payment of war debts, preferably by existing voluntary organisations, or, failing that, by a grant from the Exchequer.

(2) The extension of the almoners' system, under which a contribution towards their maintenance is requested from those patients who can afford to make it.

(3) The organisation of systematic collections from workpeople and employers of labour.

(4) The establishment of a competent authority to examine hospital accounts and consolidate appeals.

(5) Closer coöperation with the Poor-law infirmaries in which there is a large number of vacant beds that might be utilised to relieve the pressure on existing voluntary hospitals.

We shall take an early opportunity of commenting on the figures from which these important conclusions are drawn.

IMMEDIATE SELF-DISINFECTION AND THE MINISTRY OF HEALTH.

AN influential deputation from the Society for the Prevention of Venereal Disease was received by Dr. Addison, Minister of Health, on July 2nd, when Lord Willoughby de Broke submitted the following resolution:—

That inasmuch as the Ministry of Health has failed, and public bodies, including the London County Council, have declined, to provide the means of delayed disinfection against venereal disease at ablution centres, this meeting calls upon the Ministry of Health and upon local authorities to instruct all qualified chemists to sell such means of immediate self-disinfection against venereal disease as may be approved from time to time by the Ministry of Health or by medical officers of health.

He added that while everybody was agreed that all the influence of research and administration ought to be applied to the prevention and cure of venereal disease, and that all means of moral prevention ought to be constantly employed, especially with regard to the youth of the nation, the society which he represented was addressing itself to the efficacy of immediate self-disinfection, and the policy it recommended was that the Ministry of Health should take such steps as would educate the public in the whole hygiene of this important subject. Captain W. E. Elliot, speaking as a medical Member of Parliament, said that the House of Commons was intensely interested in the prevention of venereal disease, and felt that unless stronger arguments could be brought against it than had hitherto been the case, it could not continue to accept the responsibility of prohibiting the sale of disinfectants which had the approval of the medical profession. Dr. J. H. Sequeira stated that the number of new male patients, mostly ex-soldiers, suffering from syphilis, admitted for treatment at his clinic at the London Hospital in 1919 was 90 per cent. above the number attending in 1918, and that there was an increase of 15 per cent. in the total of female patients. The increase in cases of ophthalmia neonatorum and lip chancres proved that there was a definite increase in venereal disease, and that increased attendance at clinics was not merely the result of the spread of knowledge of these diseases amongst the people. Sir Archdall Reid stated that about 40,000 men passed through his hands during the war, and up to 1917 there was a vast amount of syphilis. In the beginning of January, 1917, a policy of immediate self-disinfection was advocated among the troops under his command, with the result that venereal disease practically disappeared. Mr. Wansey Bayly said that 14 borough councils, including West Ham and Holborn, in the metropolitan area, had adopted the policy of the society, and that the National Birth-rate Commission in its last report had expressed the opinion that the methods for the prevention of venereal infection by immediate self-disinfection should not be withheld from the public. Dr. A. Mearns Fraser reported his success in inducing the public at Portsmouth to accept the principle of immediate self-disinfection. Dr. C. W. Saleeby, Lady Askwith, Sir William Arbuthnot Lane, and Sir James Crichton-Browne also spoke.

Dr. Addison, in reply, said that they did not really know whether venereal disease was increasing or not, because they had no data supplied of a properly ascertained scientific kind. They knew that there was a great increase of people attending centres or clinics. The propaganda of the society represented by the deputation and the general public enlightenment were perhaps bringing people to realise that they must be properly treated. At all events, they had not got a basis of ascertained fact on which it was quite safe to dogmatise. It was suggested that the Ministry should issue certain instructions to local authorities and to the public, and he pointed out that it would be necessary to have an overwhelming case to justify such action and to avoid the conflict of opinion. They would have to contend with a great wave of public feeling which would suggest that the Government was really encouraging vice. It had been urged by the deputation that their suggested policy would be successful if scientifically and thoroughly done. That might be a true statement. They could not however, deal with a population of 40 millions on the same basis as Sir Archdall Reid, with iron discipline at his command, could deal with 2000 soldiers at one time. That was quite different from placing something at the disposal of any citizen with certain instructions as to use. They had to have a very strong case that would meet the intense and vehement opposition which such a proposal would arouse, and if they were not successful it would put the whole movement back a generation. There would be great objection raised, and he thought they must admit that a great deal of it would be well founded. To adopt such a proposal towards the population as a whole—boys and girls, men and women—would be held, and he thought with material ground, as doing something which would tend to encourage people to run risks. Last year he appointed a very strong body of men, who had reported to him that certain drugs, if properly applied, were efficacious, but if these drugs were not properly or scientifically applied their efficacy could not be relied upon. They also reported that the use of such drugs gave rise to a false sense of security and encouraged the taking of risks, and that, in spite of the most careful instructions, the issue of packets to soldiers resulted in men who used them for self-disinfection still having infection. Could they rely, he asked, on the general public properly and scientifically using those things? Two experimental centres had been established under the Manchester corporation, and so far the results were encouraging. Those experiments in Manchester were being watched with anxiety. He assured the deputation that the Ministry was anxious to take any practical measures they could thoroughly

recommend for the prevention and treatment of the disease, and they were quite prepared, if they were certain of good results, to face novel methods.

CHARLES MAYO AND THE AMERICAN HOSPITAL IN LONDON.

A DINNER was held at Claridge's Hotel, London, on Tuesday evening last, with the double object of paying a high compliment to Dr. Charles H. Mayo, the famous American surgeon, of Rochester, Minnesota, and of introducing to public notice the movement, rapidly advancing from theory to realisation, for founding an American Hospital in London. The hosts at the dinner were the President, Lord Reading, and Governors of the projected American Hospital, and the two toasts of the occasion were the health of Dr. Mayo, which was proposed by the Chairman, the Lord Chief Justice of England, and "Prosperity to the American Hospital in London," which was proposed by Mr. Balfour. Lord Reading disclaimed any ability to describe to an audience, comprising so many medical men, Dr. Mayo's professional position or the performances by which he had attained thereto, but dwelt on the fact that between the two great English-speaking peoples the inevitable links of race and language must be enormously strengthened by the interchange of scientific knowledge. Dr. Mayo gave a sympathetic sketch of what true intellectual union between England and America might achieve, and concluded a blood-curdling forecast of what war in the future would mean by stating that medical preparation to combat wholesale scientific destruction ought now to be made. Mr. Balfour, in wishing all good fortune to the American Hospital in London, concentrated upon the value of mutual understanding between America and this country on questions of medical science. He claimed, amid protests, to be the oldest man in the room, and having shown what enormous progress in medicine his span of years had witnessed, prophesied that this rate of progress would be accelerated in the future. He asked what could more surely assist to this desirable end than a practical exchange of their experiences between professors, teachers, practitioners, and even students of the two countries, such as could only be got by personal conference, and could never be supplied by any written medium. The toast was responded to by the American Ambassador and Sir Arbuthnot Lane. The American Ambassador rejoiced to know that London would soon possess an outward and visible sign of the graces of friendship and hospitality invariably extended by London to American visitors, and Sir Arbuthnot Lane then gave a rapid sketch of the activities which have culminated in the foundation of the American Hospital in London. The original idea of the institution he attributed to Mr. Philip Franklin, and he showed how on both sides of the Atlantic that idea had quickly taken root and had been developed by the energies of prominent citizens, medical and lay, until now a great institution was arriving, certain to achieve much in the future, alike in the promotion of a good understanding between the two English-speaking countries and in the facilities for research afforded. Sir Arbuthnot Lane, like all the preceding speakers, paid tribute to the great career, so sadly cut short, of Surgeon-General Gorgas, whose life-work formed a perfect example of what internationalism in medicine can achieve.

Sir Thomas Clifford Allbutt is to be sworn a Member of the Privy Council. The honour is the more signal when it is noted how few of the present Privy Councillors have become such on the ground of scientific attainment, while, as far as we know, no doctor has ever before attained to this distinction in recognition of pathological and professional work.

INDEX TO "THE LANCET," VOL. I., 1920.

THE Index and Title-page to Vol. I., 1920, which was completed with the issue of June 26th, are given in this number of THE LANCET, and will not be issued separately.

THE BRITISH MEDICAL ASSOCIATION.

EIGHTY-EIGHTH ANNUAL MEETING AT CAMBRIDGE.

THE 88th Annual Meeting of the British Medical Association was concluded last week, and on all sides those who assisted in the session have had reason to be satisfied with the work achieved, as well as with the facilities provided so generously by the University and city of Cambridge. And Cambridge was arrayed by nature for the occasion, the noble colleges and ancient streets being radiantly beautiful in the perfect summer weather.

The final ceremonies included a dinner party in Gonville and Caius College given by the President of the Association, Sir Clifford Allbutt, who is a Fellow of the College; a reception at Emmanuel College by Dr. Peter Giles, the Master of the College and Vice-Chancellor of the University; a reception by the Mayor of Cambridge at Christ's College; a reception by the Master and Fellows of Trinity College; and the Annual Dinner of the Association, held by permission of the Master in the Hall of St. John's College.

The last item on the scientific programme was the Popular Lecture, and this was delivered by Dr. G. S. Graham-Smith, who took as his subject "Flies," and once again emphasised for public information the primary part played by flies in the dissemination of disease.

SECTION OF MEDICAL EDUCATION.

THURSDAY, JULY 1ST.

This section opened with five papers on

The Place of Preliminary Science in the Medical Curriculum.

The papers were an address on the subject generally by Sir GEORGE NEWMAN, President of the section; addresses with reference to particular sciences by Professor Arthur Smithells (Chemistry), Professor Sydney Hickson (Biology), Professor Arthur Keith (Anatomy), and Professor Sir Ernest Rutherford (Physics), and a paper by Professor Lorrain Smith on the connexion between the teaching of preliminary science and pathology. Professor Lorrain Smith's paper is published elsewhere. The discourses were taken as read, the authors merely outlining the essentials in brief speeches for the purposes of debate.

The PRESIDENT commenced by calling the attention of the section to the distinction of the men who were contributing to its work and hoping that something practical, perhaps in the way of resolutions, would emerge from the debate. Passing to the consideration of the subject of medical education in general, he said that the purpose of a medical education is the equipment of the practitioner in knowledge and skill. The curriculum must incorporate the principles of medicine as interpreted in current knowledge. It must also comprehend its practice in relation to the needs of the time and the art of the practitioner. Sir Clifford Allbutt had explained that the new birth of medicine "is nothing less than its enlargement from an art of observation and empiricism to an applied science founded upon research; from a craft of tradition and sagacity to an applied science of analysis and law; from a descriptive code of surface phenomena to the discovery of deeper affinities; from a set of rules and axioms of quality to measurements of quantity." Nor were the signs of expansion limited to practical medicine; there was the new work on the cell—in physics, in chemistry, and in biology. The cell theory—cell basis, cell division, the nucleus, the nucleolus—is yielding its secrets, and something of the hidden powers of the chromosome of the germ cell and the internal secretion of chemical substances, whether they be hormone, toxin, or antitoxin, is now revealed. It would seem impossible to exaggerate the effect on the science of medicine of the new knowledge of the chemical and electrical changes going on in the cells of

living tissue. Secondly, the character of the curriculum would also depend upon the medical needs of the time. To-day there were two special factors at work—(*a*) the new claims of the State upon the doctor, social, scientific, clinical, and (*b*) the further development of clinical teaching within the curriculum—making their insistent demand on the student.

The establishment of "clinical units" was but an expression of the growth of integration. His teaching work, instead of being casual, secondary, incidental or spasmodic, would now become the chief task of the clinical instructor. Moreover, the unit consisted of a staff of competent men working as a group or team who pooled their experience, and there was full integration of the science and art of medicine and surgery, the teaching of which might thus be raised to university standard. The association of research with intimate and intensive study, which should comprehend Sir James Mackenzie's subjective and associated phenomena, should investigate the mechanism of symptoms, and should follow end-results back to their origins, was the third advantage secured by the clinical unit system.

It was by the gradual evolution of this unit method over many years that the necessity of further development in the curriculum had become obvious. Not revolution but reform was needed, and even reformers must have regard to the facts (*a*) that the scope and character of secondary education was not yet settled, (*b*) that medicine itself was in a transitional state, and (*c*) that the policy of the nation in regard to the ultimate nature of the public medical services had not yet crystallised itself. However, it would appear that the four main reforms needed in the medical curriculum were: 1. A lightening of the curriculum at both ends; in other words, fuller preparation in science before entrance to the medical school, and a postponement of instruction in certain specialties and in general practice to the post-graduate period. This question of lightening without lengthening the curriculum was of cardinal importance, as in the present overloaded condition of the five years there was insufficient time allowed for true study, for digestion and assimilation. Several remedial steps might be suggested. Elementary physics and elementary inorganic chemistry might be taken at the secondary school, though preliminary science for medical students must be undertaken in the medical school; materia medica might be greatly reduced; the didactic lectures might be diminished in number; some overlapping might be eliminated; each term might be extended by a week and the medical course commenced in April; specialism might be unloaded from the final year or at least reduced in bulk; and above all the degree examinations might be shortened and modified by assessing the class examinations as an essential part of them. 2. A fuller study of the sciences preliminary to medicine and a nearer application of these subjects to clinical work. Above all, there was great need of biology (anatomy and physiology). Its principles were the answer to many questionings. It was the fundamental theme. 3. Development of clinical teaching of university standard. 4. There was need of further State aid, though with a minimum of State control. The education of the medical man was no longer a proprietary or merely professional interest. It was of national concern, for the health of the people was the principal asset of the State.

In the course of a few introductory observations on the place of preliminary science in the curriculum Sir George Newman said that in the first place it seemed evident that the development of clinical medicine and surgery in response to the demands of the age made a new and clear call for the improved teaching of the preliminary science subjects. Some advocated their removal from the medical curriculum, but he was convinced that they were more essential than ever. Physics, chemistry, and biology were key-subjects, absolutely fundamental, which formed the basis of a general education in science, and were the only basis of sound generalisation. The great medical subjects consisted of physics, chemistry, and biology applied to the life, form, and function of the human body in health and disease. The patient was a case of anatomy, of physiology, of pathology to be interpreted and treated on grounds and by means which were essentially physical, chemical, and biological.

Sir George Newman gave examples of the application of the principles of mechanics, heat, light, sound, electricity in medical practice, and of the extent to which biochemistry and chemical physiology depended on organic and inorganic chemistry. He pointed out also the need of a closer association between physics and chemistry on the one hand and biology and medicine on the other. He recalled Huxley's warning that teaching in biology cannot be attempted with success until the student has attained a certain knowledge of physics and chemistry; for although the phenomena of life are dependent neither on physical nor chemical but on vital forces, yet they result in all sorts of physical and chemical changes, which can only be judged by their own laws. Happily, the relation between chemistry and medicine was being drawn closer. At Edinburgh there was to be a laboratory for clinical therapeutics in the hospital, the teacher of chemistry was to lay the foundations of physiological chemistry and clinical chemistry, there was an advanced course of medical chemistry for third and fourth year students, and after October, 1921, students beginning the study of medicine would have to pass an entrance examination in elementary chemistry before admission. As to biology its claim was supreme; it was the very essence of medicine, which, indeed, was but one of its forms and expressions. It was not an introduction to medicine, but its foundation. If the medical man were not a biologist he was nothing. But there was a still more important aspect of biology than that which was immediately utilitarian—namely, as the basis of comparative medicine. If there were one thing more than another which was lacking in English medicine it was its comparative study. Human anatomy, embryology, and physiology were parts of comparative anatomy; we built up our knowledge of man by study of the structure and function of animals. Likewise human pathology should be studied as part of a comparative pathology affecting both animal and vegetable worlds.

Sir George Newman indicated two ways in which progress can be made. First, biology itself can be brought into a larger place in the curriculum instead of being, as in some medical schools, relegated to a subordinate position or even neglected—unequipped laboratories, poor salaries, little opportunity, perhaps feeble apprehension. Biology must be taught in the right manner, and in due time the course might be transferred from the first to the third year. Due emphasis should be given to the comparative study of the development of the ectoderm and endoderm, the origins of the blood and nervous systems, the functioning of sense organs, the formation of the body cavity, mesenteries, primitive excretory organs, the alimentary canal, and the processes of digestion and absorption. The comparative study of protozoology, helminthology, and parasitology, and their relation to disease in man is the final issue of the course. Still another point to be borne in mind is the application of biology to society in the science of sociology, where Huxley and Herbert Spencer led the way. Sir George Newman considered the two chief needs of English medicine: (*a*) the fuller integration of its several branches and constituent parts, and (*b*) its new relationship to sociology.

He concluded: It is not only a device here or an adjustment there that is needed, it is the biological outlook and spirit that is required—the capacity "to see great truths than touch and handle little ones"—for biology, pure and applied, is the most educative, germinative, and dynamic subject of the whole curriculum. It opens the windows of the mind, it makes possible a conception of the unity of things, and it gives proportion and measurement through the entire range of medicine.

The Teaching of Chemistry.

Professor ARTHUR SMITHELLS spoke of the teaching of chemistry to medical students. He said that no one could fail to be struck by the greatly increased number and importance of the applications now being made of physics and chemistry to advance the art of healing.

Modern physiology alone had been brought to such a condition that for its full comprehension a really sound and substantial knowledge of chemistry of university standard was quite indispensable. It was universally agreed that some knowledge of the crudest facts of chemistry was quite indispensable for the medical man. Such knowledge could be picked up very quickly by anyone of moderate intelligence; it was not of necessity a serious mental exercise or intellectual outfit, and it would seem to be a matter of little importance when or where it was acquired. The teaching of chemistry conceived in this spirit was not, however, very exhilarating either to teachers or students. The dissatisfaction at present bound up with the teaching of chemistry to medical students was due mainly to the feeling among students and even among doctors that the study of preliminary science was a penalty rather than a privilege, an obstacle to be passed before one could enter upon the highway of true professional study, not a foundation to be built upon, not something to be assimilated and incorporated with succeeding knowledge.

The mere phrase-book knowledge of chemistry was certainly far from satisfying the declared aspirations of those who ultimately control the whole of medical education, and lay stress upon a proper grasp of scientific method and a scientific attitude of mind which will permeate all subsequent studies. Professor Smithells proceeded: "I think it must be admitted that we who have been teaching science in universities have failed very decidedly to achieve this end, and that somehow or another we have gone wrong. The little regard that our work has earned is shown by the deliberate act of the profession in affirming that all that we have done can now be perfectly well done at school. This means, of course, that we have neither specialised our teaching effectively towards medicine nor given it any intellectual weight which makes it the sort of thing that can only be reasonably expected from a university."

When considering schemes for arousing greater interest in chemistry in the medical student Professor Smithells suggested that professional teachers were very apt to go wrong by attributing to the average student the same sort of capacity for interest in abstract studies as they themselves, by their very nature, possessed. Some years ago Professor Smithells had decided to separate the medical students from others taking the elementary course of chemistry with the object of altering the substance and form of the teaching as far as seemed legitimate towards bringing it into closer relation with matters of special concern to the student of medicine. It seemed to him remarkable that in those universities where the teachers were their own masters so far as examining was concerned, and where they were practically free to go their own way, so little had been done to introduce a directional element into the preliminary scientific studies of medical students. Happily, there was now evidence of a considerable change. Without interesting the students it was not easy to teach them, but it was both possible and legitimate to invest even elementary teaching with a topical character. It was noteworthy that the University of Edinburgh had lately established a chair of chemistry in the interest of students of medicine, occupied by Professor G. Barger, who had explained the general lines on which he was proceeding in a letter which Professor Smithells read to the meeting. The letter began as follows:—

"It is proposed that I should ultimately have under my control (directly or indirectly) the whole of the chemical teaching of medical students, including physiological and clinical chemistry, but for the present I am teaching only inorganic and organic chemistry to first-year students and giving occasional more advanced lectures on special subjects. No previous knowledge of the subject is at present required from students entering my class, but in October, 1921, a new regulation comes into force which will demand from students coming to me an elementary knowledge of inorganic chemistry, at least up to the standard of the London Matriculation." Professor Barger then proceeded to give details of the syllabus and time allotted to various branches of the subject, and explained the principles which guided his method. He had convinced himself that before taking his degree the average medical student forgets most of the chemistry he learns in his first year. Hence he laid great stress on general principles, but mentioned little detail. Since he lectured to medical students *only*, he could afford to omit such things as the metallurgy of copper, and could illustrate general principles by examples of medical importance. His main concern was to make a basis for physiology, and hence dealt with the fats, carbohydrates, and something of the proteins pretty thoroughly, but said little about benzene compounds. According to Professor Barger, "the interest of the students is at once aroused when they grasp that they are being taught with a view to their later professional studies, and they always respond to efforts to help them in this direction."

Professor Smithells considered it desirable that medical students should be taught some chemistry at school. It was extremely difficult to do anything effective in a single year with students brought to the university at the age of 17 or 18 with not even a rudimentary knowledge of scientific facts and with their scientific faculty almost atrophied. Many medical students now had been taught chemistry at school, and in recent times the science teaching in schools had improved remarkably; but he looked upon the intensive study of science in school years with great distrust, based upon the painful experience of having had to deal much with students who arrive at the university in that worst possible plight of having a large mass of undigested knowledge and a feeling (which so far as facts are concerned might be largely warranted) that they had heard before all that would be told them. Moreover, a year in a university atmosphere ought to do something towards producing a maturity of thought, a breadth of scientific outlook, and a general intellectual stimulus that could not easily be impressed on school boys in the environment of school. But considerable reform in university teaching of chemistry must be made if the claim for university as opposed to school teaching was to be substantiated. Whatever was done in relation to the quantity of chemical teaching of medical students Professor Smithell was convinced that its quality might be greatly improved. Medical men were not often in possession of a live and available knowledge of even the fundamental principles of chemical science, and many of them regretted their inability to keep in satisfactory touch with the abundant and profoundly important discoveries now being made on the borderland of medicine and the exact sciences.

In conclusion, Professor Smithells said: "I feel that it is incumbent on us who are charged with the teaching to make a drastic reform, and I am confident that this can be done in such a way as to justify fully the retention of chemistry as an integral part of the university medical curriculum."

Physics in Medical Education.

Professor Sir E. RUTHERFORD, in discussing the place of physics in medical education, said that in several of the universities, and notably in Oxford and Cambridge, the abler students were advised to take a degree in pure science before or during their professional studies, and there could be no doubt of the great advantage to the profession of having a regular supply of able men whose training in science had been sufficiently broad and deep to take full advantage of the subsequent teaching. It was not, however, feasible for various reasons to expect the great majority of medical students to follow such a course. In his remarks he proposed to deal mainly with the pressing question of the scientific education of the *average* medical student leading up to the first M.B. The general opinion among those who had to do with the teaching of medical students in our universities for the first M.B. was that the existing state of affairs was highly unsatisfactory and called for drastic changes. He continued: "The best method of dealing with the present unsatisfactory situation seems to me to require a preliminary knowledge of science, and particularly of physics and chemistry, before admission as a medical student. This preliminary training can best be given in our schools, where, instead of being concentrated in a brief course, two years or so may be devoted to gaining a sound knowledge of some branches of physics and chemistry. The element of time is, to my mind, of great importance in gaining a grasp of scientific principles, and for this the present university training is much too concentrated." On admission of the student to the university he would have had a sufficient preliminary training to gain full advantage of the university instruction. This teaching

should preferably be given by a man of high scientific standing with some knowledge of, and interest in, the application of physics to medicine. The course should not be a repetition of the subjects taught at school but devoted mainly to a consideration of the properties of matter (electricity and magnetism), and possibly a consideration of the theory and use of optical instruments employed in the medical profession. Under properties of matter special attention would be directed to subjects like surface tension, diffusion, osmosis, &c., which were of special importance in physiological processes. A sound knowledge of the elements of electricity seemed to him essential, for not only was it of direct practical importance in several branches of the profession, but electrical ideas tended to become of increasing importance in the explanation of underlying phenomena. The aims of this course would be not to require a knowledge of a multitude of facts, but to give the student a clear understanding of the fundamental ideas of the subject and of their application in medicine.

Professor Rutherford said that his remarks applied particularly to physics and chemistry. Biology presupposed a reasonable knowledge of physics and chemistry, and since it was not likely that our schools would be capable for some time to come of providing good instruction in all these subjects, it might be desirable that biology should be taught by the universities as at present. It might ultimately prove desirable to give in addition a short course of medical physics at a later period of the medical curriculum. The third-year student was in a better position to realise the importance of physics in his more professional studies. Such a course would be analogous in some respects to the course of biochemistry which is given to medical students in Cambridge in their third year.

Courses of Study in Science for Medical Students, with Particular Reference to Biology.

Professor SYDNEY J. HICKSON opened the discussion on this subject. He said that the general result of changes in the last 40 years had been to bring the standard of medical education required both for those students who are contented with the ordinary qualification of the Royal Colleges and for the university degree students to a more uniform level. In attempting to map out the courses of study in science that should be given to medical students as a whole it was necessary to assume that potentially any one of them is capable of taking a position in the highest ranks of the profession. Any one of them might become a consulting physician or surgeon, a distinguished investigator of medical science, or a writer of standard works of reference. A course of study wide enough for a man who is to play a leading part in the profession could not be framed without including some subjects which might not be of much direct practical value to the man in a humble country practice unless the General Medical Council directed the provision of two distinct avenues, a higher and a lower, to a medical qualification, the same opportunities to acquire distinction must be offered to all students.

The question of the most suitable science courses for the first-year medical student was so closely connected with the question of his school education that it was necessary to consider what standard of education is, or should be, required before registration. At the present time a very large proportion of the students who enter the medical schools have no knowledge of any of the sciences. Those in charge of the first year science courses, therefore, had to begin with the most elementary general principles. On the other hand, the smaller number of students who have had some instruction at school in chemistry, physics, and perhaps botany, might regard their first three months at the medical school as a waste of time. It was not desirable or practicable to grade first-year medical students, and the difficulty would have to be met in another way. The real difficulty with all science classes in the first year of medical study is caused by a minority—but often a substantial minority—of students with a low standard of school education. These students act undoubtedly as a certain drag upon the machine. The time had come to demand a higher standard of general education before a student is registered. The first step would be to insist that the lowest standard accepted for registration should be that of the matriculation examination of our universities.

It had been suggested that, in order to provide more time for clinical work in the later years, the preliminary science studies should be transferred to the school period of the student's education. It would undoubtedly be an advantage if every student before entering a medical school could present a certificate of attendance on science classes in school or at a college, but Professor Hickson believed it would not be in the interests of the students, nor of the medical profession as a whole, if the standard required were in any degree lowered. There were not many secondary schools in which the standard of the First M.B. Examination in Physics and Chemistry could be reached, and very few in which any provision was made for the teaching of biology, and in consequence such a transference of science subjects to the schools at the present time would inevitably lead to a lowering of the standard. But whether there was to be a preliminary training in science in the schools or not, the first six months at least of a medical student's career in a university should be spent in the science departments.

In dealing with the subjects taken in the first year of study Professor Hickson thought it might be assumed that chemistry and physics were essential. It would be a hopeless task for any teachers to attempt to carry students into any branch of medicine unless they could assume some knowledge of the elementary principles of these sciences. Perhaps in the near future when the science courses in schools were longer and better, the teaching given to registered medical students in physics and chemistry might have a more direct and practical bearing upon medical science.

Professor Hickson then proceeded to discuss in more detail the courses in biology which he had taught to medical students for nearly 40 years. He believed that by the medium of biology even better than by other sciences, the teacher could instigate and stimulate the power of cautious thinking so necessary to the medical student. This might be the most important object of the course in biology, but it was not the only one. Before passing on to courses of study in human anatomy and physiology, some introductory course of training in biological nomenclature and methods appeared absolutely necessary. The student in the biological department learnt for the first time to verify the facts of anatomy by dissection, to use the scalpel, forceps, and scissors, to manipulate the microscope, and became familiar with the meaning of many words and expressions used in the subsequent medical courses.

There was another direction in which the course in biology might be made of great value to the future medical man. It might be urged, and perhaps with some justice, that the kind of training of hand and mind that I have already mentioned could be acquired by the courses in anatomy and physiology. It could, but with much greater difficulty both for the student and the teacher. Moreover, if this training was left to anatomists and physiologists, the courses in these subjects must be either lengthened or greatly simplified. Further, there were some things that might be of immense value for the medical man which could, and should, be taught in the biological course and could not, under ordinary circumstances, be dealt with at any later stage in the medical curriculum. In his address to the International Medical Congress in 1881, the late Professor Huxley said: "Historically the connexion of medical science with the biological sciences and the full extent and intimacy of that connexion are only now beginning to be apparent." Again: "It is a peculiarity of the physical sciences that they are independent in proportion as they are imperfect, and it is only as they advance that the bonds which really unite them all become apparent." Again, Huxley himself would hardly have ventured to predict how rapidly the advance of knowledge would reveal the bonds that unite biology to the medical sciences. Medical protozoology, entomology, parasitology, and the advancing knowledge of

the laws of heredity derived from biological research, all formed a series of most important links with medical science. Professor Hickson declared that there was only one time in the career of the medical student when the nature of these links between medicine and biology could be indicated, and that was in the course of his biological studies during the first year. In order to allow more time for the realisation of these ideals, the first step in reform must be a reduction in the number of "types" of which a detailed knowledge of structure is required. The type system, however, could not be entirely abolished, and a general knowledge of the anatomy of such forms as the frog, the earthworm, and hydra should be given as an introduction to the study of animal structure, as a training in anatomical method, and as a means of cultivating objective study.

For another purpose there should be given some lectures and laboratory work on an Elasmobranch fish and on a Mammal, but detailed knowledge of the whole anatomy of these vertebrates should not be required. Presumably the dogfish was first introduced into the first M.B. biology schedule for the purpose of assisting the student to understand the complex anatomy of the human head and neck, and Professor Hickson believed that it had admirably served this purpose. But while careful instruction should be given on the heart and arterial system, on the brain and cranial nerves, on the visceral arches and their relations, and also on the kidneys, there were many details of the structure of the dogfish which might well be omitted, and the same remarks would apply to the mammal.

In dealing with the three vertebrate animals referred to, some lectures must be devoted to the question of the fertilisation of the ovum and its segmentation, to the formation of the germ-layers, and to some of the elementary facts about the development of the organs. Facilities for adequate laboratory work might vary in different schools, but at least the early stages of the development of the frog and the first three days of the development of the chick from the beginning of incubation could be demonstrated. The study of some selected examples of the protozoa brought the student into contact with the fundamental phenomena of things that are alive, with protoplasm, which Huxley so aptly called "the physical basis of life"; with the essential features of nucleus and cytoplasm; with the function of sex; and with the problem of death.

Professor Hickson declared his strong conviction that some acquaintance with these fundamental problems should be a part of the equipment of every medical man, and he also considered as an essential part of the course some instruction in those lines of advance which bind more closely biological and medical science. He then gave a few examples to illustrate his meaning. In the biology course at Manchester he had for some years past given a short account of the structure and life-history of the house-fly (*Musca domestica*), demonstrating the difference between the house-fly and the stable-fly (*Stomoxys calcitrans*). A few words of explanation of the different ways in which these two insects might carry infection were quite sufficient to convince the medical student that he was learning something with a direct bearing on his professional work. In dealing with the protozoa some reference should be made to the systematic position and life-history of the malaria organism, of the trypanosomata, and of the entamœbæ of the human intestine. A full account of these organisms should be left to the later studies in the departments of pathology or public health, but some reference to them in the first year should be made in order to clear the mind as to the relation between the two sciences. There were many other subjects of the same kind, such as the story of ankylostoma, bilharzia, and of the human cestodes, an outline of modern researches on heredity, and the zoological position and special characters of man. These subjects need not be included in a rigid schedule, on the principle of "no more and no less," but teachers should be encouraged to indicate to the students more definitely than they had done in the past the bonds that bind together the sciences of the first year with those of the later years of their medical career. The course should be widened in its basis to make it less an effort of memory of details and more an introduction to a wide field of scientific thought. The facts in themselves did not matter much; they were the scaffolding which enabled the structure of a medical education to be built up; and if they had performed their function of giving strength and purpose to the design as a whole they could be discarded.

Speaking of botany in medical education, Professor Hickson said that many of the remarks he had made about the zoological part of biology applied with equal force to the botanical part. He considered that "the study of the organisms that lie on the vegetable side of the imaginary line that divides the animal from the vegetable kingdom, the yeasts, the bacteria, the fungi, and the lower algæ, is so intimately connected with the more advanced studies in cellular and chemical pathology that it forms an almost essential part of the medical curriculum." As an introduction to the experimental methods of physiology botany provided perhaps the most useful assistance to medical education.

The Teaching of Anatomy.

Professor ARTHUR KEITH in opening the discussion on Anatomy said that the problem to be faced was not how to improve the education of the medical student, but how to educate and reform his teachers. The suggestion to get rid of specialisation and to pick professors from the best equipped general practitioners could not be followed without arresting the progress of medicine. Without specialisation there could be no progress. "No man is fit to profess or teach any branch of knowledge unless he has a first-hand experience of his special branch, and is not only capable of adding to its stock of knowledge, but of showing his pupils how improvements can be wrought." The real problem was how a staff of specialist teachers was to produce an army of effective medical practitioners. Was it too much to expect every medical teacher to keep his professional knowledge in such a state that, if called upon, he could resume or assume the rôle of general practitioner? Professor Keith did not think so. With a reformation in the medical teacher of this kind the distinguished specialist whose vision is limited to his own specialty—be it physiology or surgery—would become more rare. Another narrow, and he thought mistaken, outlook on the part of many distinguished teachers led to the attempt to raise a school of research students. If the teacher applied himself to meet the needs of the ninety-nine who are to practise medicine generally or some special department, he would not fail to waken the latent qualities of the one promising research student who might be found in the average class of 100. For the qualities which make a student an instrument of research could not be bred in him if they had not been born in him. Here again the need of reform lay with the teacher.

One other matter needing reform was the scope of our text-books. There was a time when a student's text-book could be a complete repository of all the known facts relating to any particular subject. It was an encyclopædia to which teachers and taught referred if they desired to ascertain the extent of knowledge on any particular subject. "Our standard text-books still strive to serve as works of reference for the research as well as for the pass student. The time has come when a clear distinction must be drawn between the student's text-book and the work of reference. As time goes on the difference between them must become greater and greater. The greatest sinners in this respect are the anatomists and physiologists; their text-books could be reduced by half, with an improvement in the education of the man who is to practise general medicine." Though the general practitioner probably put into practice not a single idea or fact gained in his preliminary studies, these subjects could by no means be excluded as unfit and improper for medical students. "For the man who is to become a master workman in medicine or for one who is to advance medicine in any way they are all of them necessary and invaluable, but they are not essential for the training of a highly qualified medical practitioner. They are for him matters of general education. The proper place of

all these subjects is in the science, not in the medical faculty of a university." Speaking specially of anatomy, Professor Keith commented on its application in general practice and spoke of the desirability of reform in text-books and teaching. He concluded: "Anatomy could be made a living practical part of medicine if only the teacher would ask himself: Could this fact help me in diagnosis and treatment? If not, let that fact repose in the comfortable storage of his works of reference until it has proved its right to enter the currency of applied or applicable knowledge."

Professor J. LORRAIN SMITH then gave the address on the Relation of the Preliminary Science Teaching to Pathology in the Medical Curriculum, which appears in full at the front of this issue of THE LANCET.

The Discussion.

Dr. SIMON FLEXNER, director of the laboratories in the Rockefeller Institute, said that he did not intend to discuss the English medical curriculum, and humorously alluded to the constant confusion of his own personality with that of his brother, Dr. Abraham Flexner, who had studied European medical education. He said that it was axiomatic that education, and education alone, could put a fine edge upon generally infused talent; without appropriate educational methods the information imparted did not fructify, whereas a good system not only brought all the average to a higher level, but afforded opportunity for the best men to do the best work. This, he pointed out, was another way of saying that organisation in education is of the highest importance for all research work.

Professor PIERO GIACOSA, professor of pharmacology in Turin University, and recently engaged in the reorganisation of the Italian medical curriculum, in an address wherein the imperfect knowledge of English, for which he apologised, rendered his remarks the more forcible, inveighed against imitation specialism, and insisted that before a man made any attempt to specialise in a subject he should have a solid base of general knowledge from which to work, and then an organised period of intensive training. "Let the Germans," he said, "investigate Homer in the light of grammar, what modern research meant was an all-round understanding of the great central themes and the interacting problems involved. "Professor Giacosa made an urgent plea to the section that they should work for the establishment of an International Committee which would facilitate a proper interchange of educational facilities between the nations.

Dr. J. C. MCWALTER having expressed his deep dissatisfaction with the existing methods of medical education and having illustrated it by a curious reading of vital statistics, Dr. R. C. BUIST corrected that reading and insisted on the necessity of an accurate preliminary scientific training for the medical student, saying that over and over again he had found it necessary to revitalise the scientific training of his students. Professor RAPER, Professor of Physiology and Biochemistry in the University of Leeds, with special reference to chemistry said that he himself happened to have done a considerable amount of that subject before entering the medical profession, but that he had found the repetition of that work during his student career most useful. His chemistry, when brought into association with clinical work, became a totally different thing from his earlier knowledge. He was able to replace cram by a more philosophical attitude.

Professor JAMES RITCHIE, Superintendent of the Conjoint Laboratory at Edinburgh, asked that the psychological aspect of training should receive attention in medical education, which should mould the student's character and mind, as well as his mental capacity. This would tell greatly in the transition from school to university training. Of the preliminary subjects, he considered physics to be the most important, and he repeated a point, previously made by Dr. Buist, that the great advance occurred when the student was able to consider quantity more than quality, and to perceive the value of accurate measurement. He urged also that the various scientific and professional subjects should not be taught in watertight compartments, but that there should be correlated teaching, and that the interplay of the sciences, particularly in their medical connexion, should be made clear.

Dr. H. G. TANSLEY, in urging that the teachers of scientific subjects should concentrate in the essentials, found that instruction in biology was not treated sufficiently in this way.

Dr. F. O. BOWER, Professor of Botany in the University of Glasgow, pointed out that botany, properly taught, made an admirable introduction to medical studies, familiarising students with the common processes of life; he defended the system of set lectures by saying that the value of the work in all these discourses depended entirely on whether the lecturer was competent to deliver them. He saw no reason why training during general school life in physics and chemistry should not be quite good, but thought that the general schools of the country were not ready to instruct students in biology.

Dr. BRACKENBURY asked the meeting, when they were talking of the standards to be reached by students or to be displayed by professors, to remember that it was necessary for the practice of medicine that the general practitioner should also reach a high standard; he thought that this was just as necessary in his case as in the case of any specialist. He alluded to the unpractical nature of many examinations and many educational courses, and considered that the great need of medical students, in a revision of the curriculum, was a sound general education with which to approach physics and chemistry and biology up to a certain standard.

Dr. J. A. LINDSAY, Professor of Medicine in the University of Belfast, after endorsing Professor Ritchie's remarks on the mischief of teaching the preliminary sciences in watertight compartments, deplored the existing low standard of general education among medical students.

Dr. WARDROP GRIFFITH, Professor of Medicine in the University of Leeds, spoke on the necessity of a continuity in scientific studies. The medical curriculum must be lightened for the student, but, he pointed out, the education in preliminary scientific subjects ought to be kept alive and relied upon throughout the medical curriculum, so that if the student in the course of his clinical work came across "a bit of chemistry" he would understand it and apply the teaching properly.

Dr. CAREY COOMBS agreed with Professor Ritchie on the importance of some psychological training for the medical student.

Sir GEORGE NEWMAN read out to the meeting the following three resolutions which had been handed in:—

1. That the lowest age of registration for the medical student should be 17 years.
2. That in the forthcoming revision of curriculum promised by the General Medical Council the lightening of professional studies would be facilitated if chemistry and physics were made school subjects, biology remaining a professional subject.
3. That with a view to securing adequate training in physics, chemistry, and biology as applied to medicine by courses of these subjects within the professional curriculum, it is desirable to exact a knowledge of physics and chemistry of matriculation standard of all medical students before they are registered.

Professor A. E. BOYCOTT objected to the view implied in the second resolution, as he understood it, that the student's education in chemistry and physics should cease with his school career.

Sir GEORGE NEWMAN said that as the time allotted to the Section was now more than exhausted he would, with the approval of the meeting, submit the discussion and resolutions to the University Grants Committee, and to the Education Committee of the General Medical Council, where they would receive valuable attention.

NAVAL AND MILITARY SECTION.

WEDNESDAY, JUNE 30th.

This Section's proceedings began by an address from Colonel JOSEPH GRIFFITHS, C.M.G., F.R.C.S., the President, introducing a discussion upon

The Army Medical Service in Relation to the Education and Training of Newly-Qualified Men.

Colonel Griffiths, in a carefully reasoned paper, set out the arguments for the employment of officers of the

A.M.S., with whom he suggested those of the I.M.S. might coöperate in training the best newly-qualified doctors of the country for professional as well as administrative duties. Of the men undergoing such training, he said, those required by the Service, especially as administrators, could be kept, while arrangements could be made for placing the others in spheres of usefulness. He pointed to the double advantage of such a scheme, inasmuch as it would assist the young doctor exactly when supervision and guidance are removed, and would form an outlet for the accumulated experience of the army doctor, whose life fits him for a great variety of offices. The pensioned officer, he pointed out, did not cease to work because he was incapable, but is cast adrift by the system. Administrative or scientific posts ought to be available for such officers, while their experience would fit them admirably for training others.

Lieutenant-Colonel R. H. ELLIOT, I.M.S., said that he would not like to see State posts reserved in any way for retired officers. The positions of officers were now greatly improved, and such posts should go to the best men. He expressed the greatest sympathy for the way in which general practitioners did their work, and would like to see more of the administrative posts come their way. The good doctor is, he said, usually a good administrator.

Dr. C. A. BUTTAR, speaking after long and intimate experience of the work done at the Central Medical War Committee, urged that a liaison was necessary between the Services and the civilian practitioners, but, while so far agreeing with Colonel Griffiths, he desired to see the liaison take place not between departments or by any interchange of State posts. Colonel Griffiths would find that the best way of utilising the services of retired officers would be by approaching their civilian brethren, when he had no doubt some system of mutual coöperation could be evolved.

Colonel MCMUNN pointed out that retired officers did not cease to function; the army still had a call upon them, and the needs of the army must come first.

Lieutenant-Colonel HARVEY called attention to the Directorates now in existence in the Army Medical Service whereby Directors of Hygiene and Pathology are appointed by the War Office of high rank, and men of special interests receive special training. In this way by his seventh year of service a man might be marked out for a particular line of work and could continue in that line while attaining to the position of colonel and even general. It was no longer necessary for a man to pass into pure administration to obtain high rank.

Gas Poisoning.

An extremely interesting paper was then read upon the German gas attacks by Colonel P. S. LELEAN, who humorously admitted that he had lectured on the subject before, and had found the occasion announced as "Poisonous Gas by Major Lelean." He described in vivid language the effects of the first treacherous attack with chlorine and the vigorous methods immediately devised by the R.A.M.C. at the Royal Military College, under Sir William Horrocks, to counteract the onslaughts. There was, he said, terrible slaughter of our front line during the first attack, especially in the centre, while the situation was partly saved by the action of a young officer on the left, who, with some idea of dissipating the fumes, ordered all his men to shoot, when the din of the ensuing firing persuaded the Germans that their foul device had failed, so that they did not advance to profit by what they had done. By the time the second attacks arrived masks had been made at headlong speed by an admirable combination of science, manual labour, and commercial efficiency. Of these 5000 arrived in 60 hours, 300,000 in a week, and 2,000,000 in a month. *The second attack led to 265 hospital admissions and 13 deaths.* Almost immediately after the treacherous surprise the defence got ahead of the attack. The Germans then started the employment of lethal gasses, and so numerous were the terrible poisons which, on high authority, it was said were going to be employed, that defensive preparations had to be prepared for no less than 43 of these gasses. More, the gasses themselves had to be made as the result of intensive research before methods of protection could be devised. Colonel Lelean described the devoted work of the officers engaged in this work, who themselves submitted to terrible and prolonged tests in the lethal chamber to ascertain if the protective measures were efficacious, and efficacious over a sufficient period.

The last stage in gas warfare was the use of lachrymatories, and the reply to these was explained by Colonel Lelean, who also demonstrated the box respirators.

The paper was warmly applauded.

VENEREAL DISEASES.

THURSDAY, JULY 1ST.

This section was under the chairmanship of Mr. E. B. TURNER. Although the section is a new one it was very well attended. The largeness of the audience and the interest shown in the discussion so fully justified the formation of this new section that the chairman at the close of the meeting declared his intention of urging that on future occasions two days should be devoted to the discussion of venereal problems. Opening papers were read by Dr. MORNA RAWLINS and Dr. LEONARD FINDLAY.

Dr. MORNA RAWLINS dealt with the subject of venereal disease in women. After calling attention to the importance of the venereal problem, Dr. Rawlins discussed the question of treatment in syphilis. Three points of especial interest were brought forward: (1) the treatment of cases intolerant of arsenic and mercury; (2) the treatment of ante-natal syphilis; (3) the need of collaboration between the syphilologist and the medical officers of the special departments of hospitals. "Few medical officers working in venereal clinics can find the necessary time, even if they have the necessary skill, for careful examination of the special systems." For this reason such a medical officer should be able in case of doubt to utilise the special knowledge of his colleagues to prevent wrong diagnosis and to serve the best interest of the patient. For the treatment of those rare cases that showed a marked intolerance to arsenic or mercury Dr. Rawlins relied mainly on sulphur. This could be administered as collosol sulphur, sublimed sulphur, or intramine. The action of the last-named was particularly satisfactory and rapid, and could be taken advantage of in the treatment of mercurialism. In introducing the subject of ante-natal syphilis, Dr. Rawlins urged that more stress should be laid on clinical signs and history, and less on the Wassermann reaction. Treatment could be continued with safety right up to end of pregnancy. Even when begun as late as the seventh month the results of treatment had been very satisfactory. The treatment of gonorrhœa in women was, in the opinion of the reader of the paper, still in the experimental stage. Various preparations could be used in the treatment of the ordinary subacute case of gonorrhœa, the most useful being protargol (10 per cent.), eucalyptus oil in olive oil (40 per cent.), picric acid in glycerine (50 per cent.). Douches were of little use, but pessaries (protargol 10 per cent. or sauerin) were often beneficial. Before starting vaccine therapy a careful examination must be made for pelvic complications. If infection of the tubes and ovaries had taken place a much smaller initial dose of vaccine was advisable. Finally, before discharging a patient a very high standard of cure should have been attained. The more conscientiously this standard of cure was insisted on the less became the risk of relapse and of spreading the disease. Dr. Rawlins's paper was then discussed.

Sir JAMES GALLOWAY uttered a warning against the abuse of antisyphilitic remedies. He quoted cases that had been subjected to a severe course of treatment in the absence of any clear diagnosis of syphilis.

Dr. AMAND ROUTH advocated very energetic measures in the treatment of gonorrhœa in the female. In discussing the question of ante-natal syphilis he stated that he had come across several cases in which a positive Wassermann had become negative as a result merely of pregnancy. He believed that the placental ferments afforded some degree of immunity.

Dr. F. MACKENZIE urged that syphilitic women should be instructed how to avoid pregnancy in order that the

appalling harvest of defective and syphilitic children might be curtailed.

Mr. KENNETH WALKER claimed that the urgent necessity lay in providing these women with adequate treatment during pregnancy rather than in the prevention of pregnancy. The ante-natal treatment of syphilis was attended with astonishingly good results. A subject that demanded far more careful consideration, on account of the difficulty of treating it, was the subject of gonorrhœa in the female. Amongst other measures possible was the application of diathermy to the cervix. Although he had seen some very bad results from the use of electrical methods in the male, diathermy and electrolysis had given some satisfactory results in the female.

Colonel C. E. HARRISON agreed that the treatment of gonorrhœa in the female was still very unsatisfactory. The problem was one of drainage, and he was in favour of the use of glycerine-containing preparations rather than of strong caustics. Dr. Ainley Walker's work had suggested that the antigenic power of the blood might possibly be increased in the case of gonorrhœa by the use of such drugs as salvarsan in combination with vaccines.

The Treatment of Syphilis in Infancy and Childhood.

Dr. LEONARD FINDLAY, in introducing his paper on this subject, dwelt on the enormous loss of child-life that was directly attributable to this one disease. As an example of this could be quoted the striking figures obtained by Dr. Kerr Love, who collected the complete records of 21 families. Of the 172 pregnancies occurring in these families 75 ended in stillbirth, and of the 97 children born alive 31 were deaf or blind. Although the introduction of dioxydiaminoarsenobenzol had enormously improved the results of treatment, syphilis in childhood still remained a very serious problem. When treated with mercury alone a mortality of 71 per cent. had occurred in a series of cases under 3 months of age. With combined treatment by means of mercury and arsenic this mortality had been lowered to 20 per cent. In administering mercury amongst infants the reader of the paper relied on inunctions. Of the two methods of injecting salvarsan, intramuscular and intravenous, he preferred the latter. Intramuscular injections were practically always associated with pain and discomfort. For intravenous injections the veins of the scalp were employed. With the technique he employed the injection became a comparatively simple affair. In children over 2 years of age the veins of the scalp were, as a rule, not visible, and either the external jugular or the veins of the elbow flexure must be employed. An anæsthetic was often necessary in such cases. The initial dose for infants was 0·05 of neo-kharsivan, increasing to 0·15 or 0·20. In obtaining a negative Wassermann observations seemed to indicate that the duration of treatment rather than the total quantity of drug given was the deciding factor. The percentage of cases in which a negative Wasssermann was obtained rose steadily with the number of injections given. Amongst older children this negative Wassermann was obtained with greater difficulty. In several children of 8 and 9 years of age as many as 20 injections had failed to convert a positive into a negative Wassermann. Once a negative reaction had been obtained it very seldom became positive again. Prophylactic treatment was the only rational method of treating congenital syphilis. When this had been carried out by means of mercury and potassium iodide alone relapses had been frequent, but the use of salvarsan generally resulted in permanent benefit. All the children born subsequent to treatment were free from disease. In discussing the question from the point of view of national health, the reader of the paper urged that all miscarriages and stillbirths should be notified. If subsequent investigation and blood reaction indicated that syphilis was the cause of the miscarriage prompt treatment should be undertaken. No antivenereal campaign could afford to neglect notification. Ophthalmia neonatorum was already notifiable, yet this disease was responsible for only 20 per cent. of the blindness of childhood, as compared with 30 per cent. due to syphilis. Serious objections had been raised to notification in the case of tuberculosis, and yet these objections had been overcome. The ideal treatment of congenital syphilis meant treatment of the syphilitic mother, and in order that this should be effectually carried out compulsory notification was a sine qua non.

Dr. DOROTHY BUTCHER confessed to harbouring conservative views with regard to the treatment of syphilis. She placed great reliance on hyd. cum creta, but insisted that the preparation must be fresh and free from signs of oxidation.

Dr. AGNES DUNNETT asked whether in cases of repeated stillbirth with a consistently negative Wassermann it was advisable to insist on treatment.

Professor PECHÈRE (Brussels) complimented Dr. Rawlins and Dr. Findlay on the excellence of their papers. He was an enthusiast in the use of arsenical preparations for congenital syphilis. He agreed with Dr. Rawlins on the benefit to be obtained from sulphur, and had obtained very satisfactory results from the use of a new preparation, sulpho-arseno-benzol. Personally he had employed the intramuscular route, but after having listened to Dr. Findlay he would test the intravenous method. He found that sulpho-arseno-benzol gave rise to very little pain when injected intramuscularly.

Dr. MASTERMAN laid stress on the importance of treating congenital syphilis at an early age. The older the child the more intractable the disease tended to become.

Dr. HUDSON considered that notification of stillbirths was an excellent idea. It would materially assist in the antivenereal campaign.

Dr. MACKENZIE warned against placing too much reliance on the Wassermann reaction. The public and a portion of the profession accepted a negative Wassermann as a certificate of cure.

Mr. TURNER, in rising to close the discussion, emphasised three points. The first was the advisability of cultivating the clinical instinct, and of not relying entirely on accessory methods ef diagnosis, such as the Wassermann reaction. The second point was the urgent need of early diagnosis and early treatment in dealing with venereal disease. The third the necessity of preserving professioual secrecy. When the public was ready to accept compulsory notification such a measure would come. Such a moment had not yet arrived.

After Dr. FINDLAY had replied to the various questions that had been raised the meeting was adjourned.

During the course of the afternoon demonstrations were given in methods employed in the treatment of venereal disease. Dr. J. E. BARNARD demonstrated the use of dark ground illumination in the detection of the *Spirochæta pallida*. He also showed a method of testing condensers by means of an instrument he had invented for the purpose. Colonel HARRISON discussed the treatment of gonorrhœa in the male, and Dr. RAWLINS gave a demonstration of instruments employed in the treatment of gonorrhœa amongst women. The demonstrations were very well attended.

SECTION OF MEDICAL SOCIOLOGY.

FRIDAY, JULY 1ST.

The Future of Medical Practice.

An illuminating discussion on the Future of Medical Practice took place on July 1st, in the section of Medical Sociology. The views of all sections of medical practitioners were clearly represented; in addition, Dr. T. R. BROWN, of the staff of the Johns Hopkins Hospital, Baltimore, gave the meeting information as to hospital arrangements in the United States, and Mr. Alderman JENKINS enunciated the views of the Labour Party with regard to a whole-time medical service. In opening the discussion,

Sir GEORGE NEWMAN said his task was to organise on behalf of the community a profession whose whole tendency is individualistic; we must not lose that precious quality individualism, hence the "nationalisation" of the medical profession is an impossibility. But profound changes have occurred recently; within

a handful of years the State, in a fit of absence of mind, has in 20 or 30 Acts of Parliament placed statutory duties on individual practitioners; a new relationship must be created between the State and the doctor. The profession is fearful of the imposition of some cast-iron system which might in practice make the medical practitioner servile, dependent, and fettered. To promote a clear and well-established understanding the doctor must acquire a knowledge of the evolution of local government, and the main purposes of the bodies dealing with health, pensions, Poor-law, education, and insurance; the layman, besides specialised knowledge of the work with which he is primarily concerned, should learn as much as he can of professional tradition and sentiment, of the scope and opportunity of voluntary work which touches the profession, and of professional organisations and of their history and relation to each other.

Five outstanding problems now faced the medical profession in its relation to the State.

First, we must find a new unit of health government. In defining the areas of the Poor-law unions, the local sanitary authorities, the local education authorities, the Insurance Committees, and the local War Pensions Committees the country has been mapped out five times over, but the charting has been done by different hands at different times and for different purposes, causing duplication, overlapping, and confusion. Clearly, there would be advantage in having one authority for all health purposes. Another common-sense requirement is uniformity of administration in all comparable areas; all through the country there is need for the adoption of accepted standards and a larger measure of equalisation and uniformity of central and local action. The plan evolved must represent not what the State alone or medicine alone would prefer but the will of the people at present. We require an extension and coördination of medical provision. At present there is inadequacy, unequal provision, and piecemeal effort; we must bring together in proper relation the provision of medical treatment in the home, at the clinic, in the hospital, and in the convalescent home not for the pauper class only, but for the whole of society. A properly connected medical policy will not arrive in our lifetime; all that we can hope to do is to lay some of the foundation stones. The future of the hospital system constitutes another problem with many issues. We have at present no connected hospital system; the relation of hospitals to each other and to the contributory clinics and the insurance system is a typical issue which calls for settlement. A fourth subject, and perhaps the most important of all, is an adequate method of education of the undergraduate and the practitioner. A different kind of doctor is needed in these new times; he requires in addition to the learning and skill of former days an improved training in new subjects, in preventive medicine, and in the political science of communal responsibility. Some specialisation of practice there must be, but we must recognise that such diseases as tuberculosis and venereal and heart disease will never come under control until and unless the general practitioner is in a position to deal with them. Lastly, the medical man of this new age is concerned with the advancement of humanism. The doctor must be the chief educator of the people in the way of health; in being that he cannot escape his share of responsibility in the study and handling of many of the medico-sociological problems which surround us—education, recreation, housing, the conditions of industry, sobriety, cleanness of living, the prevalence of venereal disease, prostitution, the penal laws, the causes of certain crimes, the integrity of family life—all such matters concern us, and to fulfil our vows we must be concerned with them. We cannot be wise healers of the patient or the community without a large sympathy and a liberal humanism. But we must not think that the medical factor is the only or the decisive factor; we must interrelate medicine with the social, moral, and ethical movements and aspects of man's mind.

Sir WILMOT HERRINGHAM dealt with the problem from the point of view of the consultant. Although it is sometimes said that the advance of the general practitioner is so great that the consultant is no longer necessary, he thought that consultants would not only persist but increase; not only will the growing points of special technical skill and scientific knowledge necessitate fresh classes of consultants, but also there will always be the sage reflection that two heads are better than one, and the desire to satisfy the anxieties of the patient and his friends.

With the advance of medical science the consultant has to consult more persons himself; at present these consultations are carried out with the maximum of expense to the patient and waste of time of everybody concerned. The poorer patients had the best treatment in the world—that provided by the hospital. Five or six specialists meet in the ward and consider his case; this system works quickly, without friction or much trouble, and the minimum expenditure of time. Contrast this with the nursing home, rarely built for its specific purpose; the other men whose opinion is wanted have either to make a special journey there or the patient has to make an uncomfortable if not painful journey to them. The great need is for some form of institution within the means of the ordinary middle-class patient; the nursing home's charges equal those of a first-class Atlantic liner. The only sound remedy is to extend to private patients the benefit and convenience of treatment at a hospital. Proprietary hospitals run by a doctor with other doctors as employees will not catch on in England. In London there has long been, in Fitzroy Square, a paying hospital financed by laymen which the patients use as they would use a nursing home and where they are attended by the doctor of their own choice and make their own arrangements about fees. At St. Thomas's the paying wards are much on the same system. At King's and Guy's only the staff of the hospital attend the paying patients. The ideal is that the hospital should be the centre of a doctor's life; his home should be in the country and he should journey daily to the hospital and see his patients there, both those who come to consult him as well as the in-patients.

Dr. ALFRED LINNELL spoke from the point of view of a doctor practising in an isolated district. He considered the feeling of the bulk of the general practitioners was so strong against a whole-time medical service that there was no danger of their becoming State servants. The problem of the future of general practice consisted in the proper dove-tailing of a State-controlled service into the general scheme of practice.

In the sphere of preventive medicine the employment of whole-time officers with special training is inevitable, but closer coöperation between these officers and the general practitioners is highly desirable; the latter should be given every opportunity to learn preventive work and be employed at a remunerative wage in any preventive work he is able to undertake. In prenatal work the general practitioner should play an all-important part. For school medical work the whole-time man is more satisfactory from the point of view of administration, but it is hoped that the employment of general practitioners will increase, and no doubt with more experience such a system could be made to work quite smoothly. After the age of 16 the State, through the Insurance Acts, invades the domain of curative medicine in a very decided manner. Although there is room for improvement in certain directions, it would be wise to give the reconstructed panel system a thorough trial. Criticisms of the system are somewhat ungenerous; they fail to recognise that five of the seven years of its working have been war years. All parties seem to unite in condemning the present State system of the medical care of the poor, but it is difficult for Poor-law medical officers of long standing to understand the reasons for this opprobrium. Probably in the future some panel system with free choice of doctor will be adopted in which the local authorities will stand in the relationship of employer.

The relation of the general practitioner to midwifery is rapidly changing; the provision of well-trained subsidised midwives has caused a considerable transfer of normal midwifery from doctors to midwives, but the ideal in a domiciliary service is the association of doctor and midwife in every case, so as to enable the younger doctors to acquire the experience which is necessary if he is to cope with the abnormalities to which he is summoned by the midwife. The provision of maternity homes is an urgent necessity; they make an enormous difference in the comfort of the patient and the doctor. Powerful forces are on our side in getting these homes; the difficulty of obtaining domestic help during the confinement is so great that some provision of this nature must shortly be forthcoming. The rather complicated technique of modern methods of treatment of venereal disease has warranted the establishment of clinics with specially equipped officers in charge, but with increasing equipment of the general practitioner in this respect the necessity for the employment of special officers will probably cease.

As regards tuberculosis the appointment of special officers was probably wise and necessary; they have important consultative and administrative duties to perform. It is on the matter of treatment that difficulty arises; sometimes a doctor is at a loss to know whether he is responsible for treatment or not. He is possibly responsible for certification but not for treatment. He is not kept fully informed of the patient's progress while in the sanatorium. All this could be easily avoided. The "dispensaries" should be

"clinics" for consultative purposes, and at every stage the doctor in attendance should be kept fully informed and made in every way responsible.

The increasing complexity of diagnosis and treatment renders it imperative that greater facilities and better equipment shall be available for the doctor in his battle with disease, while the increasing expense renders some form of organisation an urgent necessity. The associated local health centres proposed should become the general practitioner's spiritual home. Study leave during the early years of practice is urgently necessary; the State should give the financial aid required. The system of assistantship should be further extended and men given an insight into the art of general practice; this would be preferable to systematic teaching in the schools by medical practitioners. State interference in curative medicine means necessarily not only the provision of medical attendance for certain sections of the people with the requisite supervision and control, but also the supply of that organisation of special services, institutional treatment, and post-graduate training for doctors which is at present lacking and can only be provided by the State.

Professor GOWLAND HOPKINS'S address was a plea for personal contact of the laboratory worker and the clinician. Communications between them now are practically limited to the post; the clinician asks a definite question and merely expects the answer, "Yes" or "No." But if they were to meet and think together the possibilities of the laboratory as an aid to diagnosis would develop.

It is remarkable, he said, how largely the use of chemical methods in diagnosis has been confined to mere tests for albumin or sugar in urine. Much earlier information and more discriminating knowledge concerning renal failure can even now be obtained by simultaneous analyses of blood and urine, and on the same lines a better realisation of the significance of this or that case of glycosuria. So also estimations of alveolar carbon-dioxide tension made simultaneously with determinations of the hydrogen-ion concentration or the alkali reserve of the blood are giving fresh precision to knowledge in other diseases without inconvenience to the patient.

How are we to catch the patient to apply these micromethods of blood analysis? Twenty years ago precautionary visits to the dentist were confined to ladies; it will perhaps be less unthinkable 20 years hence than it would seem to be now for the middle-aged to pay precautionary visits to the doctor on behalf of their kidneys. It is often held that this laboratory work should be concentrated in a few large centres. Dr. Hopkins wished to combat this view strongly; if adopted it would cut off the laboratory worker from the stimulus of real contact with the clinician and clinical material.

Later in the discussion Sir KENNETH GOADBY, who acted as liaison officer during the war between the clinician and the laboratory worker, said that the surgeon and physician were prone to scorn the laboratory in the earlier stages of disease and seek help too late. When both got together we should get team work of the utmost value. If laboratories were established all over the country where the general practitioner could do some work in his spare time, he could guide the laboratory worker, who has a tendency to go off on side issues. In dealing with industrial disease especially does the general practitioner want the help of the laboratory; there are several methods of early diagnosis of lead poisoning available before symptoms are present. If the doctor takes the specimen to the laboratory himself he will ask supplementary questions of the greatest value. To enable us to help the industrial worker the Labour Party must assist in the discipline of its members; when we attempt to collect facts the workmen must help by giving full information.

Mr. E. W. MORRIS, House Governor and Secretary of the London Hospital, said that the present position of the hospitals was the result of self-sacrifice on their part. In the stethoscope days the cost of a bed was £60 a year; owing to the increasing complexity of diagnosis department after department had been opened and the cost in 1914 had gone up to £150 a year. But this was a healthy increase; the present cost, £200 a year, represented an unhealthy increase.

The hospitals were proud of having been able to manage with voluntary support only hitherto, but they were prouder still of being able to do good work and, if necessary, would have to break away from voluntary work alone. £100,000 a year could be collected for a hospital by voluntary subscriptions; £200,000 could not. Money must be got either from the patients or from the State. The locality of the London Hospital made any proposal to close a part of the hospital and reopen it for paying patients impossible, but each patient should pay what he can afford; he should certainly pay his "hotel" expenses if possible. As regards money from the Government, the London Hospital would put their pride in their pocket and take what they could get, but there is the principle of humanism to be considered. The hard mechanism of the Poor-law infirmary might creep into the hospital; we must not do away with the blessing of giving. But this is a different thing from receiving State help for services rendered. Seventy-five per cent. of the patients in the London Hospital are panel patients. Some of the panel doctors in the vicinity have a panel of 10,000. The hospital gets nothing for this work from the doctor or the patient.

The feeling is changing as regards the payment of the honorary staff. Mr. Morris holds the view that the staff should give their whole time to the hospital. He would divide the beds into groups, and for a period of, say, five years, appoint a whole-time medical officer at £2000 a year, with assistants appointed for one year, the first at £1000 a year, the second at £800, the third at £365. For each unit two resident house men are required and a special secretary to undertake the card-index work; proper laboratory help is also necessary. Such a medical and surgical unit are in existence at the London Hospital. Each has about 70 beds and sees out-patients on two afternoons a week. He would like to see posts found in these units for doctors in general practice; the unit would gain by the information the general practitioner could bring concerning early stages of disease.

Many reforms are wanted in hospital management. Above all, a future must be made for the nurses; at present there are only 12 positions in the country with a salary of £400 a year or more. Half the hospital beds are in the wrong place. The average stay in hospital of a patient is three weeks, two of which could well be spent in a less expensive institution. The war has taught us another lesson; we want a coördinating centre so that if a patient cannot be taken into one hospital the friends can learn where he can be admitted. Much of the work done at present is wasteful; chemists are examining samples of drugs, &c., for each hospital separately, whereas this work could easily be done by a common staff.

Alderman C. S. JENKINS expressed the views of the Labour Party. Before the passing of the Insurance Act it was difficult for a workman to get adequate medical attendance; nowadays, when the average wage on which he had to support a family was less than £4 a week, he had very little money to spend on the doctor. The Insurance Act does nothing for women and children. The facts as regards industrial hygiene are appalling; in the boot and shoe industry the average age at death is under forty; 90 per cent. of the deaths are due to respiratory diseases. In the iron and steel trades the average age at death used to be 39, but just before the war the figure had improved to 49. Why should men die at this age? The reason was that flesh and blood are cheap. He agreed that during the war the doctors were overworked, but panel practice was not what it should be. The Labour Party wants the profession to educate workers in the preservation of their health and to study the conditions under which the workers live and work. During the war, when the value of labour was recognised for the first time, the Government set to work to prevent diseases and did good work. Why cannot this work continue? The party are not asking for a whole-time medical service without a *quid pro quo;* they were willing to give the profession the control asked and an adequate wage.

Dr. BROWN (Johns Hopkins Hospital, U.S.A.) spoke on conditions in the United States. The employers there seemed to take more interest in industrial hygiene. The hospital system recognises the middle-class patient. In all hospitals there are public wards with free beds; some of the patients pay the cost of their keep, $15–17 a week; others paid what they could afford. For private patients the wards are divided by curtains into cubicles; two or three bedded rooms were also provided at slightly higher charges. State-aid provided a certain number of beds which were automatically free; this arrangement works well, but the teaching hospitals had not adopted the system. For private patients grouping of specialists under one roof has been initiated; the consultants worked in adjoining rooms and had a secretary in common.

Dr. GIRDWOOD (St. Andrews Institute) described the system carried out at St. Andrews under Sir James Mackenzie, where a bacteriologist, chemist, and radiologist worked with three panel doctors. Two hours each day were spent on research work on patients selected from the panel patients, who were all seen at the institute. Each member of the staff makes himself *au fait* with a specialty. Research cases are discussed once a week, when provisional diagnoses are made and treatment decided. Continuous notes of the cases are being taken and digested; as time goes on the actual disease will be tracked to its beginnings.

Dr. F. J. BLACKLEY (Bristol) said that more leisure was required if the busy practitioner is to engage in research. A busy evening in the surgery was worth £3–£4 to a doctor; he must be certain that his time, if spent in other ways, would bring him in an equivalent.

Dr. H. B. BRACKENBURY (London) said that the general practitioner was the humaniser whose need had been pointed out; he was also the pivot of the whole system advocated. The consultant, the laboratory, the hospital bed all exist to help the general practitioner. He is the preventer of disease; in the sphere of personal and domestic hygiene he is all-important. He will prevent the need of all these big institutions advocated. He must be a well-educated practitioner and must not be rushed in his work. The pay must be such that he need not see an overwhelming number of patients in order to secure a reasonable income. To obtain this end he would be prepared to accept any arrangement, State or otherwise.

Mr. E. B. TURNER (London) agreed that the doctor who had attended a family throughout a generation did an enormous amount of preventive work; he was given opportunities of stamping out disease in its incipient stages.

Dr. A. FULTON (Nottingham) said that the efficiency of the general practitioner lay in his capacity, his equipment, and his conscience. The State could improve his equipment by providing study-leave, expert advice by consultants, and instruments of precision. You will never get all the patients into hospitals; his (Dr. Fulton's) daily visiting list includes 26–30 patients. The root of the matter lay in the improvement of the conditions under which general practitioners work.

Dr. P. MACDONALD (York) said that although the speakers who opened the discussion were very indefinite as regards actual proposals, it was evident that they were pleading for an assumption by the State of the responsibility for the health of the nation. Although he was enthusiastically in favour of such a proposal, he wished to utter a word of warning. Unless the interference of the State led to a better condition of things any change would be disastrous.

There are three essentials, he said, of a satisfactory State Medical Service. First, the service should be complete. Obviously all the sections of the medical service necessary cannot be established complete at once, but any section dealt with by the State should be dealt with completely. It might, for instance, be possible to set up a State Hospital Service by itself to begin with—and this is, at present, the most important of all medical requirements, but very soon the coördination of all forms of service under the State would certainly be necessary. Second, that the medical profession should have the greatest possible share in the management and control of the service. Third, that provision for the services should be adequate. Unless ample financial provision be made to allow the medical service to be of the very best, then any further interference by the State should be strenuously resisted by the medical profession.

It is doubtful if the politicians have given much thought to the cost of a satisfactory medical service. He has attempted to form an estimate of the cost of a fairly satisfactory medical service for the city of York.

(*a*) General Practitioners' Service: The cost of the present panel service for this year is about £19,100. To extend this to dependents would multiply the cost by three, making a sum of £57,300.

(*b*) Hospital service. The expenditure of the York Hospital for 1919 was about £20,000; the hospital serves a larger area than the city, but the amount apportioned to the city is about £13,000. The community, however, needs thrice its present hospital accommodation; the cost would be approximately £40,000, which might be reduced by the establishment of "paying" beds to £32,000. These figures do not include the payment for medical services, an essential with State control; a minimum amount of £8000 should be allowed for this purpose.

(*c*) Present State Medical Service, including the activities of the Public Health Department, Poor-law, War Pensions, and mental diseases. Some of this medical work could be handed to the general practitioner and the cost merged in those of the practitioner and hospital services. The public health medical officials are at present underpaid; the present cost of about £37,000 could only be slightly reduced to about £32,500.

(*d*) The present Poor-law Infirmary (370 beds). The annual cost is approximately £13,000 of which £11,200 is incurred by the city of York. Only about two-thirds of the beds are used; the cost of the beds required might be estimated at £10,000.

(*e*) Additional Services. The above makes no provision for dental service or the services of such specialists as pathologists, laryngologists, dermatologists, &c. A sum of £7500 might be allotted for this purpose. The sum-total is £147,162 for a population of 80,000; the present cost per head to the State is about 16*s*.; the increase is about 20*s*. Working on these figures the cost to the State of a fairly complete medical service for the whole country would be between 70 and 80 million pounds a year, an increase of between 40 and 50 millions on the present cost without including the sum representing interest and sinking fund on capital costs.

From his experience in connexion with the initiation of the panel service Dr. Macdonald is doubtful if the Ministry of Health is prepared to advise the expenditure necessary for the establishment of an efficient service. Any satisfactory solution of this medical problem is impossible as long as this country is run on its present lines; the politician must be replaced by the scientist, who, if he were free to solve the problem of production, could enable the country to earn even the vast amount of money required for our urgent medical and social needs. All we medical sociologists can do at present is to help to promote a public opinion which will bring peace to the world and to influence the politician to give that endowment to science that will bring about increased production.

EXHIBITION OF SURGICAL AND ELECTRICAL APPLIANCES, DRUGS, AND FOODS.

There were things worth seeing at the exhibition held in the Cambridge Corn Exchange; we doubt whether on any previous occasion there has been offered at these meetings a more scientific or attractive presentation of exhibits.

Surgical and electrical apparatus mainly occupied the field, though there was a good show of drugs, including synthetics and improved antiseptic preparations made by our own manufacturers. On the whole, the section comprising foods was dull and without any outstanding features, if we except the attempts made at some of the stalls to convince the visitor that vitamines had been captured. The fine building, with its admirable lighting provision gave the exhibitors ample opportunity for setting forth their exhibits under favourable conditions, and they did so with artistic regard. The stalls were decorated with good taste, and the exhibits were placed in attractive fashion. In beginning the review of some of the principal objects shown we propose to classify the exhibition into the following divisions: I., Surgical Apparatus, including electrical appliances and scientific instruments; II., Drugs, including antiseptics; III., Special Foods; IV., British Spas; and V., Literary Exhibits.

I. *Surgical Apparatus, including Electrical Appliances and Scientific Instruments.*

The interest of the display of surgical appliances turned largely on the developments arising out of the treatment of injuries and mutilation occasioned by the war. The "P-K" Arm, Ltd., of 8, Southampton-row, London, W.C., showed, for example, mechanical hands and arms described as almost human. The improved types demonstrated are designed specially for manual workers and others who have lost an arm. The successful application of these fittings in the practical affairs of life is remarkable, and shows great ingenuity. The principles underlying the mechanism, together with examples of application, have been described in our columns.[1] The orthopædic appliances of the Gloucestershire Surgical Appliances Co., of 1, Belle Vue Lawn, London-road, Cheltenham, also deserve notice. The construction of these shows

[1] THE LANCET June 8th, 1918, p. 793.

admirable adaptation where mechanical assistance is called for in bodily deformity, arising from disease, war casualties, and so on. In addition to orthopædic appliances, Newlyms, of 24, South Molton-street, London, W., demonstrated an interesting series of artificial limbs adapted to all amputations. The exhibit included special arms for heavy manual workers and attachments adapted for all occupations. Amongst the special features at the stall of S. Rampling, of 8, Regent-street, Cambridge, was the "Kenney" Featherweight Artificial Leg, described as the lightest leg made, suitable for all amputations, the weight of the limb for above-knee amputation being 4¼ lb. An exhibit which attracted great interest was that of Mr. H. Brook, of 8, Parkhurst-road, Sutton, Surrey. Here were models of masks for facial disfigurement, including, amongst other applications, those designed to cover loss of jaw, tongue, and ear. The designs showed great ingenuity, and were studiously inspected by the medical visitors.

Surgeons found in the exhibit of Messrs. John Weiss and Son, Ltd., of 287, Oxford-street, London, W., a profusion of modern instruments which drew their attention. Most of these were well described as new inventions. Another exhibit of up-to-date surgical instruments was that of Messrs. Down Bros., of 21 and 23, St. Thomas-street, London, S.E., the appliances shown giving striking illustration of recent advances. Features of this exhibit were the specimens of aseptic hospital furniture for use in the operation theatres and wards of hospitals. A novel presentation was that of Messrs. Spencer, Heath, and George, Ltd., of 48, 52, 54, Goswell-road, London, E.C., who exhibited examples of their apparatus for carrying out medical gymnastic exercises, designed for the treatment of stiffened joints and weakened muscles. This exhibit proved very attractive in bringing to view useful methods of physical treatment in many directions. The advances in the mechanics of that very important branch of surgery, dentistry, found illustration in the exhibit of the Dental Manufacturing Company, Ltd., of Alston House, Newman-street, London, W., where there was demonstrated a complete equipment for dental supervision and treatment to be used in maternity and child welfare centres, school clinics, and general public service. Amongst a selection of modern surgical instruments, Messrs. Arnold and Sons, of Giltspur-street, London, E.C., showed their latest models of steam and electrically heated high-pressure sterilisers and also an operation table, the important and attractive feature of which is the "Everbrite" metal, a name which explains an obvious claim.

Surgical developments were profusely illustrated on the well-arranged stall of the Surgical Manufacturing Company, of 83 and 85, Mortimer-street, London, W. Here were new examples of guillotines, urethral dilators, ophthalmoscopes, and mention is deserved of the "Surgman" pattern of sphygmomanometer for measuring the maximum systolic blood pressure. This apparatus appears simple in construction, is compact, and an important advantage is that the mercury in the instrument cannot be spilled, a clear drawback to previous designs. The exhibit included a series of sterilisers constructed on scientific lines. As the name implies, the Genito-Urinary Manufacturing Co., Ltd., of 66, Margaret-street, London, W., exhibited a wide selection of genito-urinary instruments, including cystoscopes, urethral dilators, bladder retractors, and so forth, designed by well-known surgeons. Mr. Henry Lewis, of 2, Westmoreland-street, New Cavendish-street, London, W., made a point of deformity appliances, including an unbreakable leg instrument, a splint for the treatment of ununited fractures and trusses adapted for all cases. Messrs. Maw, Son and Sons, Ltd., of 7 to 12, Aldersgate-street, London, E.C., exhibited appliances of surgical interest, including an intestinal retractor (Richardson), useful, it is claimed, when portions of fixed gut deep down in the abdomen have to be sutured or stitches put in the bladder. There was also exhibited a special safety chloroform inhaler, which, amongst other things, provides against air being pumped in the wrong direction and the possibility of liquid chloroform, as such, being projected. A large assortment of surgical instruments of every description was to be seen at the stall of Messrs. Mayer and Phelps, of Chiron House, 59–61, New Cavendish-street, London, W. These comprised urological, gynæcological, ophthalmic, laryngological, nasal, aural, and anæsthetic appliances. The latter included a "safety-first" chloroform inhaler, as in the previous exhibit, guarding against the risk of ejecting chloroform out of the bottle, and Shipway's improved apparatus for the administration of warm anæsthetic vapours was also shown. The main interest of the visitors in the exhibit of Messrs. Hawksley and Sons, of 357, Oxford-street, London, W., appeared to be centred upon the apparatus associated with heart research work, blood-pressure gauges, and hæmocytometers. The instruments shown had the hall-mark on them of well-known pioneers of medical science. A very impressive and artistic exhibit was that of Messrs. Allen and Hanburys, of Plough-court, Lombard-street, E.C. There was here a profusion of surgical requisites and appliances, as well as of fine chemicals.

Electro-medical apparatus was a marked feature of the exhibition, and the developments in X ray outfits—transformers, interrupters, fluorescent screens, and so forth—were of a very interesting character. There was a profusion of apparatus shown also providing currents for galvanism, ionic medication, electrolysis, cautery, sinusoidal current, and faradisation. X Rays, Ltd., of 11, Torrington-place, Gower-street, London, W.C., exhibited a remarkable series of new models of X ray tubes and the electric accessories which their use involves. The new radiator-cooled Coolidge tubes, rectifying their own current, attracted particular attention. With these tubes it is possible to employ a simple high-tension transformer on a main alternating current supply without any mechanical rectifiers.

In addition to radiographic apparatus for general purposes, Messrs. Frederick R. Butt and Co., Ltd., of 60, Conduit-street, Regent-street, London, W., demonstrated a 10-inch coil outfit specially built for dental surgeons, a transformer type of apparatus, and a complete set of accessories for dental radiography. This interesting exhibit included a diathermy apparatus for thermic treatment and surgical operations. The firm, well known in the past as Harry W. Cox and Co., Ltd., has now amalgamated with the Cavendish Electrical Co., Ltd., under the title of the Cox-Cavendish Electrical Co., Ltd., of Twyford Abbey Works, Acton-lane, Harlesden, N.W. They made a special point of their "standard" X ray group, suitable for a large hospital. The important claim is put out that with this group instantaneous radiography may be undertaken, exposures being possible with a gas X ray tube of only a fraction of a second. There should be mentioned also their combined galvanic and faradic switch-table, used on a large scale through the war, which provides the current for galvanism, faradism, and rhythmic interrupted currents. Apparatus for ionic medication, particularly in gynæcology, was shown, special electrodes being designed for the purpose. We have already described the Snook interrupterless machine[2] made in the workshops of Messrs. Newton and Wright, of 72, Wigmore-street, London, W. The apparatus is described as consisting of a rotary converter with direct current, a closed circuit transformer, and secondary rectifier. It is all enclosed in a cabinet with spark-gap milliamperemeter, and so forth, the whole outfit being under ready control. The exhibit includes a simple X ray plant for dental work and a series of well-proved tubes and accessories.

Modern developments in X ray appliances were well illustrated at the stall of Messrs. Schall and Son, of 71–75, New Cavendish-street, London, W., who claim for their outfit that it can be put together in a compact way, and so improvised as occasion requires. Portable diathermy apparatus for operations in the bladder and local treatment formed part of this interesting exhibit. Besides the well-known "galvanoset"

[2] THE LANCET, Jan. 30th, 1909, p. 328.

apparatus, a liquid rheostat for ionisation, galvanisation, electrolysis, and so on, the Medical Supply Association, Ltd., of 167–185, Gray's Inn-road, London, W.C., gave an interesting exhibition of Professor Bergonié's apparatus for the treatment of obesity, cardiac derangement, and conditions set up by deficient elimination. There was here, also, an instructive display of surgical appliances, including operating tables. New electro-medical developments were much in evidence at the stall of Messrs. Watson & Sons, of Sunic House, 43, Parker-street, Kingsway, London, W.C. They made a feature of their high tension transformer, described as an outfit complete in cabinet with either rotary converter for direct current supplies or synchronous motor for alternating current supplies, including close circuit transformer, high tension rectifying disc, large milliamperemeter combined with a trolley switch table fitted with resistance and auto-transformer controls. Altogether this was a fine display of up-to-date X ray apparatus, while it included other electro-medical applications and an exhibit of radio-active substances. Amongst the interesting exhibits on the stall of the Cambridge and Paul Instrument Co., Ltd., of Cambridge, was what is described as the Cambridge Electro Cardiograph, the action of which depends upon the variations of the minute electric currents due to the heart's action causing deflections of a fine fibre forming part of the galvanometer. The current variations are recorded photographically, the magnified image of the fibre being projected on to a camera. The exhibit included well designed microtomes and thermometers giving 24-hours records of the patient's temperature.

(To be continued.)

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

Australasian Medical Congress.

ARRANGEMENTS for the forthcoming Australasian Medical Congress to be held in Brisbane in the end of August are well forward. Interest will centre in the decision which is to be made as to the future constitution of the Congress. At present it is open to all reputable members of the medical profession who subscribe. It is proposed that henceforth only members of the British Medical Association will be eligible. A ballot paper with a direct question will be furnished to each member of the Congress, whether he be present at Brisbane or not, so that every member who has paid his subscription, will be able to record his vote in favour or in opposition to the proposed change. The result of the voting will be announced at the final meeting of Congress on Saturday, August 28th, 1920. The discussion at the final meeting will depend upon the result of the ballot. Should it be determined that the Congress as it is constituted at present be discontinued, a consideration of arrangements for future combined meetings of the profession will be needed. In this event, the matter will also be referred to the B.M.A.

Criminal Abortion.

The Commissioner of Police in Victoria recently addressed a circular letter to the general hospitals, asking that the members of the staff should communicate at once to the police any instance coming under their notice of a presumed illegal operation. The reason for such a step was said to be the great increase in such operations, and in order to uphold the law two detectives had been detailed to be at the service of the hospitals at any hour. The hospital committees sought the opinion of their staffs, and the question was ultimately brought before the Victoria Branch, B.M.A. The Council of this body sent a deputation to the Commissioner to point out the difficulties surrounding the proposal, but advised the hospital authorities that the matter would be referred to the Federal Committee of the Association for an opinion.

Alien Enemy Practitioners.

Considerable feeling has been displayed in Sydney and in Brisbane in connexion with the attitude of the Federal authorities towards two practitioners of German origin and training in allowing them to remain in Australia. Both these practitioners were interned during the war, and the contention is that they should have been compulsorily repatriated. The New South Wales branch of the B.M.A. resolved to approach the authorities in the case of Dr. Max Herz, and at a special meeting of the Council of the Victoria branch the following resolution was carried:—

> That this Council strongly supports the New South Wales branch in its action regarding interned alien enemy practitioners and in the specific instance of Max Herz.

Personal.

Sir Henry Maudsley is about to retire from active teaching at the Melbourne Hospital. About 1902 he resigned his position as indoor physician at the Alfred Hospital and was elected to a similar post at the Melbourne Hospital, which he has held ever since, being granted leave during his service at the front for four years. At a recent staff dinner Sir Henry Maudsley was presented with a silver token as an expression of the esteem in which he is held by his colleagues. He will join the consulting staff, and will continue to hold his appointment as lecturer on medicine in the University.

The death is announced of Colonel H. W. Bryant, M.R.C.S. Eng., who was a well-known and popular practitioner in Melbourne. Colonel Bryant was one of the first to volunteer for oversea service, and was in charge of field ambulance units and hospitals in the heart-breaking period of disaster in Gallipoli and received mention in despatches for his work. But the strain told on his own health, and he was forced to return to Australia. He was able after a rest to render further valuable aid as a member of referee boards, but never completely regained strength, and died after a lingering illness at the age of 59. The late Colonel Bryant had taken an interest in military medicine for many years before the war, and left Australia with the rank of Lieutenant-Colonel.

HOUSING NOTES.

Remedy for Slums.

THE Special Committee under Mr. Neville Chamberlain, M.P., recently appointed by the Minister of Health to advise him as to the principles to be followed in dealing with unhealthy areas, will shortly issue an interim report dealing specially with London.

The three main impressions so far formed by this Committee are that the problem of the London slums is vast and complex; that it is intimately linked with that of transport and the distribution of houses, offices, and factories; and that any comprehensive reconstruction of slum areas while the housing shortage is so acute is impossible. It is pointed out that 550,000 London people live in unsatisfactory housing conditions, and that nearly two-fifths of this number occupy areas definitely unhealthy. Transport facilities, by not keeping pace with the needs of the growing districts, have added to the difficulties which have compelled labour to remain in the central area, while a constant increase in site values has raised rents; thus the inhabitants have had to measure their accommodation not by their need, but by their purse. Many thousands of houses built for one family are now occupied by two, three, or even more, without any addition to the sanitary conveniences. The condition of working-class houses in London is considerably worse now than before the war, and the combination of overcrowding and deterioration makes the problem of improvement extremely urgent.

Two main alternatives are suggested by way of remedy. The first is to allow the population to expand vertically by building taller houses. This suggestion is regarded by the Committee as quite unsuitable for a working-class population dependent on its own efforts for domestic service and the care of children. Supervision is necessary if the occupants of many-storeyed buildings are not to be at the mercy

of any undesirable tenant and of the spread of infectious disease. Access to playgrounds in the open air is difficult, except by those occupying the lower floors, and construction is no cheaper than that of equivalent accommodation in two-storey cottages. Where such cottages are available, block buildings are left untenanted. The lower floors in high buildings are apt to be sunless; the higher ones bad for women and children. The Committee considers that multi-storey buildings cannot be regarded as making any serious contribution to the solution of the housing problem, and that their erection should be subject to severe restriction both as to height and as to nearness to other buildings.

Redistribution of population.—The second alternative—namely, redistribution of population, the removal of large parts of it bodily elsewhere, rearranging the population left on the old sites with adequate accommodation, and the requisite open spaces—requires time, and must be combined with measures of prevention as well as of cure. No improvement in congested areas can be hoped for if they are allowed to become still more congested by the further demolition of houses to make way for more profitable buildings, and it would seem necessary to discourage any increase of labour-employing establishments in these areas. The Committee is strongly of opinion that side by side with restrictions concerning the slum areas in London there should be encouraged the starting of new industries and the removal of existing factories to garden cities, to contain not more than 50,000 residents, and to be surrounded by a belt of agricultural land. The Committee notes that all past attempts at slum clearance and re-housing have been unconnected with one another and with the problem as a whole. The inter-relation of housing, transport, and industry has not been taken into account. The Committee advocates one general plan for all Greater London, in which exist no fewer than 122 local authorities responsible for housing. A plan should be prepared now which would assign to the various districts their respective functions, so that every reconstruction scheme may conform in its main details to this plan. Further, a body should be set up at the earliest moment with jurisdiction in these matters over an area comprising the Home Counties as well as London. The powers and duties of this body should include: (1) the preparation of a plan for the whole area; (2) general direction of transport development; (3) the adjustment of local finance and rates to bring about an even distribution of the burden among the various local authorities, who would retain their executive powers.

The Committee points out that the effect of slum clearances in the past has often been to push the old inhabitants into adjoining areas which have thus become overcrowded and have eventually degenerated into fresh slums. Where new buildings have been erected in place of those demolished very few of the original occupiers have returned. In six improvement schemes carried out by the London County Council only about 2 per cent. of the displaced population became tenants in the new buildings. "We are not satisfied," says the report, "that any persistent effort has been made to retain these old inhabitants. Generally speaking, we are of opinion that it is wise to avoid sudden change in the conditions and life of the classes under consideration. We believe that the system followed by the late Miss Octavia Hill, by which old houses were carefully repaired and kept under kind but strict supervision might be extended with immense advantage to all concerned pending the possibility of reconstruction." The Committee adds that it does not see how any such extension is to take place under the present system of ownership, and has come to the conclusion that the only way of insuring general improvement is to substitute public for private ownership in unhealthy areas.

PROPOSED EXTENSION OF HAM GREEN HOSPITAL.—Dr. F. R. Seymour, of the Ministry of Health, held an inquiry recently at Bristol in regard to the application of the City Council to borrow £10,605 for the extension of Ham Green Hospital for isolation and tuberculosis cases.

Public Health.

REPORTS OF SCHOOL MEDICAL OFFICERS.

Hull.—The nutrition of the children attending elementary schools in the city of Hull continues to be satisfactory in spite of the abnormal economic situation in the country. The number of children systematically examined during 1919 in the code groups amounted to 14,920. The state of these children as to nutrition was estimated as normal in 77·6 per cent. and good in 8·2 per cent., only 0·14 per cent. being considered to be actually badly nourished. The average body-weights are slightly above those found in the previous year but the estimates of nutrition, as gauged by the general appearance of the children, are slightly below those of 1918. Dr. James W. Fraser, the school medical officer, alluding to this anomaly, considers it to be due to "substitutes for animal food being used, which increase the weight by fattening, but do not make the firm flesh and pink elastic skin which count for much in the estimation of nutrition." Fat is so much lighter than flesh that the increased weights are perhaps more likely to have been due to increased nitrogenous nutriment than to increase in the fatty food or tissues. Verminous condition of the children, both in body and head, has caused a good deal of trouble, and has necessitated prosecution in several instances; 30 parents were convicted and fined for allowing their children to become verminous after having been cleansed at the corporation cleansing station. Unfortunately, 772 children, who had been found to be verminous at the first examination in 1919, left school during the year without being cleansed. With regard to the employment of children out of school hours (619 boys and 22 girls), most of the boys (384) were employed as errand-boys in various businesses. A curious fact is mentioned in regard to this: "The poverty of the district served by a school does not increase, but diminishes, the employment of children attending that school." The figures are described as the opposite of what might be expected if it were on account of the necessities of the parents that children were sent to work out of school hours, and point rather to the thrift of the parents in the better districts and the thriftlessness of those in the poorer. Physical training is carried out with energy and success. An important advance has been made during 1919 by the institution of a "field afternoon" once a week, this now being the practice in 72 departments; from most departments three classes (about 150 children) attend one of the four public parks, or five other open spaces, so that about 10,800 children enjoy a "field" period of one and a half to two hours every week. Football, cricket, rounders, &c., are included in this phase of physical training. The ailments of the children are cared for at three clinics, where 76,749 attendances were registered during the year, chiefly for "minor ailments," eye cases, ear discharge, and dental trouble. Of ringworm of the head there were 428 cases, and of these 338 were cured, the method of treatment being almost entirely that by ethyl iodide, with an average time, for those who attended regularly, of 8·7 weeks. This is extremely satisfactory, and if maintained will obviate the need for installing an X ray apparatus. In the dental department an increasing number of parents are bringing their children for examination and advice, but more instruction in oral hygiene is needed, both for children and parents. The disease that caused most interruption to school attendance was granular ophthalmia, for which 928 children were excluded; this is a serious complaint, when of long standing, but responds quickly to treatment if taken in time; there is therefore all the more reason, as urged by Dr. Fraser, that every doubtful case of inflamed eyes should be seen by the medical officer as early as possible.

Richmond.—Of the 3763 children on the registers of elementary schools at Richmond (Surrey), 1266 were medically examined at the routine inspections in 1919, as well as 772 specially brought forward for medical

advice, and 627 examined by the school dentist. Of these dental cases 62·6 per cent. were found to need treatment, and 61·8 were treated, which is very satisfactory. No children were found to be suffering from actual malnutrition, and only six were recommended to be kept under observation on this account. There was no definite heart disease or pulmonary tuberculosis. Enlarged tonsils, or adenoids, or both, were referred for treatment in 47 cases, and 112 children were kept under observation. There seems to have been an undue prevalence of ringworm, scabies, and impetigo, not in the code groups, but among the school children generally; but with this exception the health conditions of these children in 1919 appear to have been very satisfactory, and Dr. J. H. Crocker, who presents the report, is to be congratulated on the fact that so many of the children recommended for treatment—viz., 1101 out of 1151—were actually treated.

PRESENTATION TO SIR JOHN MACALISTER.

IN the Barnes Hall of the Royal Society of Medicine the presentation took place, on Wednesday afternoon, of a cheque representing the proceeds of the testimonial fund which had been organised on behalf of Sir John MacAlister. The circular announcing the fund was issued on March 1st to every Fellow of the Society, and time was allowed for those Fellows resident abroad to respond.

Sir HUMPHRY ROLLESTON, the President of the Society, in opening the proceedings, remarked that some men were many-sided and touched humanity at many points, and Sir John MacAlister was a very human man. For that reason he had troops of friends of all kinds and in many lands, and those who were present were there to show their affection for him, for he had a genius for friendship. All knew him as the most unselfish and devoted of men, not only great in sympathy, but prompt, even impulsive, to help. The late Sir William Osler, also with an infinite capacity for friendship, described Sir John MacAlister as "the man who pokes the fire," a simile descriptive of the activity which makes things move and produces results.

Sir ARBUTHNOT LANE, the treasurer of the fund, warmly supported the President's remarks, and hinted at the power wielded by Sir John MacAlister in bringing under the notice of the Government practical suggestions of administrative importance which were generally productive of fruitful development.

Mr. PERCY DUNN, honorary secretary to the fund, referred to the warmth of feeling expressed in the correspondence which he had received. Contributions had come from the United States, Canada, India, East Africa, the Argentine Republic, and from Pekin, 11,500 miles distant. The fund, he stated, had proved very popular among the numerous friends whom Sir John MacAlister had attached to himself.

The PRESIDENT then presented the cheque for £711, the amount, after the deduction of expenses, which the fund had realised.

In reply, Sir JOHN MACALISTER was at first reminiscent. He showed that experience, as resident librarian, in Berners-street, had detached him from medicine, a career which in early life he had intended to follow. He became impressed with the conviction that the old Royal Medical and Chirurgical Society was an entity, capable of vast expansion. So it was that his life and his activities became centred in its progress. It touched him more deeply than he could express to have found so many testifying their kindly feelings towards him, and with the utmost sincerity he desired to thank them all from the bottom of his heart. In his concluding remarks he paid a special tribute to the loyalty and helpfulness of the Society's staff, whose faithful and self-denying services, in their varying capacity, had contributed so much to the advancement of the general interests.

ELECTION OF THE HONORARY STAFF TO A HOSPITAL COMMITTEE.—At a meeting of the subscribers to the Liskeard Cottage Hospital, Cornwall, it was decided that the honorary medical and dental staff should in future be ex-officio members of the committee.

ARMY HUTS FOR CONSUMPTIVES.—At a meeting recently held at Tiverton it was decided to purchase two army huts for tuberculous patients, at an estimated cost of about £500. Sir Ian and Lady Amory have contributed £250 towards the expenditure, and have given permission for the huts to be erected on their land.

Correspondence.

"Audi alteram partem."

THE PELLAGRA OUTBREAK IN EGYPT.

To the Editor of THE LANCET.

SIR,—No greater compliment could have been paid to the work done upon pellagra by Dr. J. I. Enright and myself than the fact that it called forth the long letter from Dr. James Goldberger in your last issue. I have the profoundest admiration for the work of Dr. Goldberger, and I would hesitate to cross swords with such an authority if I did not feel that he, like so many great men, was not infallible.

I was afraid when I read Dr. Enright's paper in manuscript that his statement that the diet-deficiency theory of pellagra was exploded did not quite convey his real meaning. It would appear that what he actually intended was that in the case of the German pellagrins no food deficiency could be traced, though such, he admitted, was found among the Turkish pellagrins. This I tried to make clear in my paper by saying that, though most cases could be explained on the diet-deficiency theory, some undoubtedly could not. To account for this latter group I assumed that something else was in operation, and I adduced that the something else was of the nature of a toxin. Now Dr. Goldberger writes that because of Dr. Enright's cases I was forced into the toxin hypothesis. In part that is the truth. He then endeavours to show that Dr. Enright has not proved his case as to the diet of the German prisoners. That being so, my hypothesis is superfluous.

Dr. Goldberger makes much of the point that Dr. Enright did not clearly state that the German prisoners consumed the diet that was ordered for them. Doubtless Dr. Enright himself will supply the evidence for this, but on a priori grounds the objection is a poor one. Does Dr. Goldberger mean to suggest that the German prisoner would not eat his food because he had had such good diet prior to capture that his food as a prisoner was distasteful, or that the flavouring or cooking was at fault? Surely anybody who has seen the Teuton engaged in the engrossing occupation of eating can but smile at such a suggestion. Dr. Goldberger continues with the argument as follows. Because such a relatively small number of prisoners became pellagrous it cannot be that the diet was at fault, but rather the fault must lie with the man himself for not consuming the food supplied to him. Will Dr. Goldberger explain to me why certain of the prisoners would not eat? The various associated diseases were common to all, so that no argument on these lines is of avail. Surely the only answer is that the prisoners who developed a pellagrous rash did not eat because they did not want to, being in the pre-eruptive stage of the disease; or, having eaten, could not assimilate their food owing to the same cause. I maintain, therefore, that a toxin was at work in these cases.

In this connexion I should like to refer to a case at present under my care. About last Christmas the wife of a professional man suddenly lost all appetite and was unable to eat the food that formerly she had relished. About three months later she developed a typical pellagrous rash. Dr. Goldberger will smile and say, "Exactly—food deficiency followed by pellagra." However, there was no reason whatever for her sudden dislike for food, and I feel certain that she did not eat because she already had pellagra, and not that because she did not eat therefore she became pellagrous. Do the majority of phthisical patients become pellagrous? Do those suffering from carcinoma ventriculi or any other wasting disease show evidence of pellagra? Our experience is utterly against such a view. Any unbiased observer must agree that in many of the cases of pellagra something more than a mere food deficiency is present. This something more, I maintain, is probably a toxin.

Food deficiency explains many cases of pellagra, but not all, and if Dr. Goldberger wishes his splendid work

on this subject to live he should consider the ways in which a diet outwardly sufficient may fail to be assimilated by the patient rather than state, with insufficient evidence, that the patient does not eat the food presented to him.

I am, Sir, yours faithfully,

Liverpool, July 3rd, 1920. A. DOUGLAS BIGLAND.

THE INVESTIGATION OF RENAL EFFICIENCY.

To the Editor of THE LANCET.

SIR,—Having read with great interest the paper on the Treatment of Nephritis by Dr. H. MacLean and Dr. A. E. Russell in THE LANCET of June 19th, in particular from the point of view of the increasing means of determining the adequacy or inadequacy of the kidneys, which the laboratory places at our disposal, I am anxious to draw attention to an aspect of the problem (as it presents itself to the clinician), which is not touched upon by the authors. It is this: that the body as a whole presents to us an organism, which, in the process of time, has developed a high degree of specialisation—to this organ the elimination of water and carbonic acid, to that organ the elimination of the nitrogen output, certain salts and water, and so forth, but that the specialisation has not been completed, and that other tissues and organs in minor and minimal degrees cover more or less the same functions. Thus there is no doubt that the bowels and the skin (to name these two only) overlap the kidneys functionally more or less, *even in health;* but that *in disease* it is almost certain that their powers of elimination rise in proportion to the renal inefficiency and to an extent which may convert them into adjuvant or compensatory organs of appreciable value. It comes, then, to this: that it does not suffice, in respect of any particular function, to determine the degree of efficiency of a given organ; in other words, to assess its value. We must go further and endeavour to assess the value of the system at large in respect of this same function. This is where we must hope that the laboratories will come to our aid; but it is just here that we realise the complexity of the problem, and that it will be a long time before it can be adequately tackled. Meanwhile, it is here that the clinician comes in, who, eye to eye with his patient, takes a broad view and endeavours to assess the vitality of the man as a whole, his expectation of life, and, while it lasts, his prospect of living to some purpose. Pending the fuller developments of the science of medicine herein lies its art.

I am, Sir, yours faithfully,

HARRINGTON SAINSBURY.

Wimpole-street, W., July 2nd, 1920.

THE TREATMENT OF NEPHRITIS.

To the Editor of THE LANCET.

SIR,—I was much interested in the paper on certain aspects of nephritis by Dr. H. MacLean and Dr. A. E. Russell, which appeared in your issue of June 19th, and I should like to ask the authors one or two questions as to treatment arising out of their very suggestive article.

1. Is the urea treatment advocated for cases of parenchymatous nephritis with œdema of any value in œdema from other causes—e.g., cardiac?

2. In connexion with the impaired excretion of salt in these cases and consequent accumulation in the tissues, have they any experience of or do they recommend a salt-free diet? I remember years ago it had some vogue with certain physicians; I do not know whether it is still advocated. I never saw any marked result from its use myself, though theoretically it should be of great benefit.

3. With regard to the urea-concentration test, Is there any danger, say in a case of interstitial nephritis, of precipitating an attack of uræmia by administering a large dose of urea to a patient who is already suffering from an excess of urea and similar nitrogenous waste products in the blood?

Further enlightenment from the authors on these three points would be of considerable interest to the general practitioner.

I am, Sir, yours faithfully,

Portsmouth, July 4th, 1920. E. W. DEWEY.

HIBERNATING MOSQUITOES AS CARRIERS OF MALARIA.

To the Editor of THE LANCET.

SIR,—Permit me to thank Dr. C. M. Wenyon for correcting, in THE LANCET of July 3rd, the account of one of his findings on the above subject recorded in my book "Malaria at Home and Abroad." The results of field and laboratory work in Macedonia now communicated by Dr. Wenyon are of great interest in connexion with the occurrence of malarial infections at a time prior to the incidence of the current year's anopheline mosquitoes, and may perhaps be used to explain similar occurrences in England. Most of the infections of local origin in this country happen during August and September, but occasionally infections occur as early as May. These must be due to anophelines (*maculipennis*), which became infected in the previous autumn and lived through the winter; and on p. 91 of my book I mentioned two views relating to the manner in which the malarial parasite might survive in the particular "hibernating" mosquitoes concerned. Having regard to the observations of Dr. Roubaud,[1] who showed in France that sporozoites in the salivary glands of anophelines somewhat quickly degenerate and lose their infecting power, Dr. Wenyon's discovery that in nature the zygote (oöcyst) stage of the parasite retains its vitality in hibernating mosquitoes all through the winter is of great importance. It indicates that the mosquito host plays a less transitory rôle in malarial endemiology than has been ascribed to it hitherto, and explains satisfactorily the occasional occurrence of malarial infection in the spring.

I am, Sir, yours faithfully,

Symons-street, S.W., July 5th, 1920. S. P. JAMES.

THE CLINICAL DIAGNOSIS OF DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—In reply to Dr. H. Drinkwater. He confirms his previous position, which I did not misinterpret in my letter, that naked-eye diagnosis is more important than bacteriological examination, and he goes on to say that the latter has always established the accuracy of his clinical observation. I congratulate him, but in an experience of 13 years' work in fever hospitals of 500 beds or more, during eight of which I was responsible for the instruction of students, I have not been so successful, and I say at once that I cannot correctly diagnose diphtheria from the naked-eye appearance of the fauces.

When Dr. Drinkwater describes and illustrates the criteria on which he relies for his own skill, I maintain that exceptions to every one of them are found with some frequency in the practice of a large fever hospital. Even if they were reliable, all the drawings in the world would not enable him to impart such a degree of proficiency to students and post-graduates as would enable them to dispense with or even minimise the importance of bacteriological examination, and in view of the deaths and infections that are known to every M.O.H and fever hospital M.O. to have resulted from the reliance on naked-eye observation, which is even now quite sufficiently prevalent, I regard his teaching as dangerous to the community. Hence my protest.

Only recently in the examination of a large number of children I found diphtheria bacilli in the throats of many in whom definite faucial abnormalities were present, none of which, however, could I discover in Dr. Drinkwater's paper. The patients were removed to isolation hospitals, where the diagnosis was confirmed by independent observation. As regards scarlet fever, does Dr. Drinkwater seriously advocate waiting for the rash before making a diagnosis? What about the cases that have no rash, many of which can be detected by examination of the fauces in the early and most infective stage. My own experience is that some of these present the criteria which he assigns to diphtheria, and I should be sorry for the inmates of the ward to which

[1] Annales de l'Institut Pasteur, vol. xxxii., No. 9, 1918, p. 452.

anyone who thus relied on the naked-eye appearances would presumably admit them. To sum up. I hold clinical and bacteriological diagnosis to be equally essential because one supplies the deficiencies of the other, and that Dr. Drinkwater has not made out a case for the comparative "importance" of the former.

I am, Sir, yours faithfully,

A. KNYVETT GORDON.

Bedford-square, W.C., July 3rd, 1920.

THE ASSESSMENT OF HAND INJURIES.

To the Editor of THE LANCET.

SIR,—In his very interesting remarks on this subject in your issue of July 3rd, Dr. Francis Heatherley mentions that he would have liked a fuller expression of opinion as to the proportional disability of the loss of the hand as compared with amputation higher up the limb. He is quite correct in stating that "amputation of a hand or complete loss of use is a very serious disability and that a lesser assessment on the usual scale compared with amputation higher up is only justified when the man can be fitted with a useful appliance." In dealing with cases under the Workmen's Compensation and Employers' Liability Acts and also under Common Law this very point has to be seriously considered. Under the Ministry of Pensions there is a hard-and-fast schedule which has to be strictly adhered to.

The recognised policy of conservatism as applied to the surgery of the thumb is equally applicable to the forearm and the arm; especially the former. The longer the stump below the elbow the greater the prospect of being fitted with a useful appliance. Just before returning from France I paid a visit to the École Provinciale D'Apprentissage, Charleroi, an institution for the re-education of the disabled, which, it is interesting to note, was founded in 1908. Here was to be seen a man with both hands off. He had been amputated through the right mid-forearm and at the left wrist. With the aid of suitable appliances he was able to work at brushmaking in a most competent manner.

I am in agreement as to the remarks in reference to artificial arms. The more complicated, the less likely to be used. One artificial hand attached to a 5 inch below-the-elbow stump was recently brought to my notice. It was remarkable for its simplicity, as it consisted of a rigid "thumb" with "fingers" having springs at the joints. The man was able to write perfectly when wearing it. In citing this case (a young man of 25, a bricklayer by trade, now no longer able to follow his former occupation) I might repeat a statement I have made elsewhere that "a serious hand injury may be the means of promoting the sufferer from a lower to a higher grade of occupation."

The supreme importance of trying to get adults and elderly men to follow their pre-war occupations (where possible) may be accepted as one of the first principles in dealing with the reconstruction of the disabled.

I am, Sir, yours faithfully,

Royal Hospital-road, S.W., July 3rd, 1920. J. J. SCANLAN.

NOVARSENOBILLON IN THE TREATMENT OF GUINEA-WORM.

To the Editor of THE LANCET.

SIR,—I have been reading in THE LANCET with very great interest letters written about the treatment of guinea-worm with tartar emetic given intravenously. It may be of interest to your readers, and also to the writers of the previous articles, that I have tried treating cases in my hospital here with N.A.B. and have had good results. I started doing this after reading the first letter, giving 0·15 g. N.A.B. with 20 c.cm. cold, sterilised, distilled water. I would be very glad to hear if any of your readers have had the same experience.

I am, Sir, yours faithfully,

CHARLES GEO. GREY,
Captain; Medical Officer.

Ikot-Ekpene, via Port Harcourt, Nigeria, May 24th, 1920.

THE MEDICAL DIRECTORY, 1921.

To the Editor of THE LANCET.

SIR,—The annual inquiry form has been posted to every member of the medical profession whose address is known to us. If the form has failed to reach any practitioner a duplicate copy will be forwarded upon application. Your obedient servants,

THE EDITORS OF THE MEDICAL DIRECTORY.

7, Great Marlborough-street, London, W. 1, July 5th, 1920.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. G. T. Broatch to be Surgeon Rear Admiral.

Surgeon Commanders to be Surgeon Captains: A. Gaskell, E. J. Finch, F. J. A. Dalton, E. Sutton, A. R. Bankart, M. L. B. Rodd, H. L. Penny, R. A. Ross, D. W. Hewitt.

Lieut. G. C. Angell placed on retired list.

ROYAL NAVAL VOLUNTEER RESERVE.

Temp. Surg. Sub-Lieut. W. G. Robertson's temporary commission terminated.

ARMY MEDICAL SERVICE.

Major and Brevet Lieut.-Col. (temp. Lieut.-Col.) R. B. Ainsworth to be temporary Assistant Director-General, and to retain his temporary rank, vice Major (temp. Lieut.-Col.) A. B. Smallman.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. A. M. MacLaughlin relinquishes the acting rank of Colonel.

Capt. J. Bennet, from Special Reserve, to be Captain.

SPECIAL RESERVE OF OFFICERS.

Capt. W. F. McLean relinquishes his commission and is granted the rank of Lieutenant-Colonel.

Capt. W. F. Wood relinquishes the acting rank of Major.

TERRITORIAL FORCE.

Col. Sir G. T. Beatson, late A.M.O., Lowland Division, Territorial Force, to be Honorary Colonel for the R.A.M.C. Units of the Lowland Division, Territorial Army.

The undermentioned officers to be Deputy Assistant Directors of Medical Services to the Divisions shown against their names: Major F. W. Squair, Highland Division; Major (Brevet Lieut.-Col.) H. A. Leebody, Lowland Division; Major C. J. Martin, Northern Division; Major J. Ward, Home Counties Division.

Major (acting Lieut.-Col.) C. J. Martin relinquishes the acting rank of Lieutenant-Colonel on ceasing to be specially employed.

Capt. R. Eager to be Major.

Capt. G. P. D. Hawker resigns his commission and is granted the rank of Major.

Capts. F. M. Hughes, E. S. Brentnall, G. W. C. Hollist, I. C. Keir, C. E. Anderson, A. N. Crawford, and G. F. White resign their commissions and retain the rank of Captain.

1st Western General Hospital: Capt. (acting Major) T. R. W. Armour relinquishes the acting rank of Major on ceasing to be specially employed.

4th London General Hospital: Capt. E. B. Clayton resigns his commission and retains the rank of Captain.

1st London Sanitary Company: Capt. W. C. Lyons resigns his commission and retains the rank of Captain.

ROYAL AIR FORCE.

Capts. M. C. Breese and H. T. Prys-Jones are transferred to the unemployed list.

INDIAN MEDICAL SERVICE.

The King has approved of the retirement of Major-General H. Hendley.

HOSPITAL SUNDAY FUND.—The following are among the amounts received at the Mansion House up to July 7th, when the total sum from all sources had reached £60,000:—

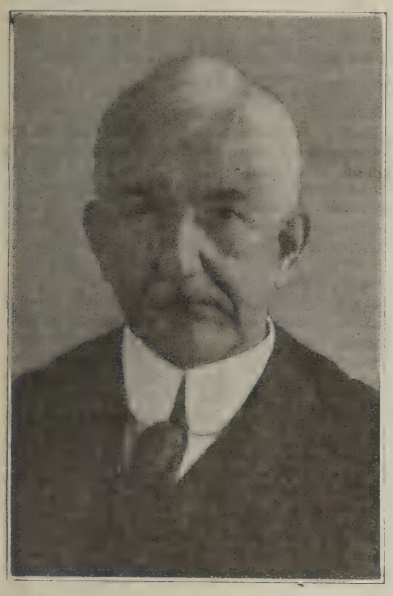
£4000: The Right Hon. the Lady Strathcona and Mount Royal; £1000: Lloyds Bank, Ltd., and the National Provincial and Union Bank of England, Ltd.; £525: Forestal Land, Timber, and Railways Co., Ltd.; £500: London County, Westminster, and Parr's Bank, Ltd., Chartered Bank of India, Australia, and China, and Hong-Kong and Shanghai Banking Corp.; £315: Watts Watts and Co., Ltd.; £300: Sir A. H. Brown; £262 10s.: Sir John Latta; £210: Blyth Greene, Jourdain, and Co., Ltd.; £200: Anon, Bank of Australasia, Lieut.-Col. More-Nisbett, and Thos. Stevens and Sons, Ltd.; £105: Grace Bros. and Co., W. Gardiner and Co., Ltd., United National Collieries, Ltd, Anglo-Egyptian Bank, Ltd., London and Brazilian Bank, Ltd., British Bank of South America, Ltd., Gas Light and Coke Co., Wilson Sons and Co., Ltd., Amalgamated Industrials, Ltd., M. Isaacs and Sons, Ltd.; £100: Alexander Shipping Co., Ltd., Anon, Albert E. Reed and Co., Ltd., Messrs. Dodwell and Co., Ltd., Messrs. Naumann Gepp and Co., Ltd., Messrs. Matthew Wrightson and Co., Ltd., W. Weddel and Co., Ltd., Voile and Wortley, Imperial Bank of Persia, Miller and Richards, Ltd., Balfour Williamson and Co., W. D. Graham-Menzies, J. A. Roberts, Cannon Brewery Co., Ltd., Pierce Leslie and Co., Ltd., C. Tennant Sons and Co., Ltd.

Obituary.

WILLIAM CRAWFORD GORGAS, K.C.M.G.,

SURGEON-GENERAL, U.S. ARMY.

THE death, after a long illness, of Sir William Gorgas, Surgeon-General of the United States Army, took place on July 3rd at the Queen Alexandra Military Hospital at Millbank. He was the best-known and most uniformly successful medical administrator, not of his age alone but of any age, and his work is comparable only with that recorded of Moses. No sooner were discoveries made tracing an endemic disease to a source removable by rigid hygienic measures than the services of this master-administrator were requisitioned to the farthest quarter of the globe to carry out such measures. And as if by magic—black magic as it appeared to the slovenly, careless inhabitant: white magic to the admiring world outside—the areas were cleansed and freed. But there was no magic other than that wielded by a strong personality with only one idea in mind—the speedy accomplishment of the work of the moment. Havana, Panama, the Transvaal, the endemic regions of yellow fever in South America, Serbia, are only the best-known sites of his activities. Truly he "let observation, with extensive view, survey mankind from China to Peru," though negotiations with Peru itself, whose Government attempted in 1919 to procure his services for a campaign to rid the Republic of yellow fever, malaria, and plague, were then abortive.



WILLIAM CRAWFORD GORGAS,
SURGEON-GENERAL, U.S. ARMY.

William Crawford Gorgas was born at Mobile, Alabama, on Oct. 3rd, 1854, and was the son of General Josiah Gorgas, of the Confederate States Army. He graduated A.B. at the University of the South, Sewanee, Tennessee, and qualified M.D. in 1879 at the Bellevue Hospital Medical College, New York University, where he remained for a year as interne. He was appointed surgeon in the U.S. Army in 1880 and promoted to captain assistant surgeon in 1885, the year of his marriage to Marie Cook, daughter of William Doughty, of Cincinnati, who survives him. His promotion in the service was rapid. He became a surgeon-major and chief sanitary officer of Havana in 1898. In appreciation of his work there he was made colonel, assistant surgeon-general by special Act of Congress in 1903, and surgeon-general, U.S. Army, in 1914. Since 1907 he had been the Permanent Director of the International Health Commission of the Rockefeller Institution, with headquarters at Washington.

The story of the riddance of Havana from the curse of yellow fever has been told often enough, but deserves to be recalled here; for it was typical of Gorgas's work. During the last 45 years of Spanish rule on the island of Cuba the number of deaths from yellow fever occurring annually in the capital, although varying greatly from year to year, was never below 50, and many times exceeded 1000. The work of Major Walter Reed and his colleagues pointed strongly to the prevention of yellow fever being bound up with the destruction of the mosquito *Culex* (now called *Stegomyia*) *fasciatus*, or the prevention of its bites. Major Gorgas, as he then was, lost no time in putting this theory to a practical trial. As he himself tersely phrased it: "The only infected material from the towns looked after was the sick man, who was carefully sought out and screened from mosquitoes." Havana was, and remained, in unrestricted communication with half a dozen infected towns; commerce was not interfered with and no restraint was placed upon the admission of clothing or bedding from infected localities; but under a purely anti-mosquito régime, during the year 1901–02 only five deaths from yellow fever were recorded. Seldom has a scientific discovery been applied so promptly and successfully to an administrative problem.

The magnificent Panama experiment followed. Up to the year 1904 the preliminary campaign waged by the American authorities against climate and disease in the Isthmus had sustained a repulse as decisive as it was regrettable. In May, 1905, Colonel Gorgas was freed from the bonds of red tape that fettered him. President Roosevelt, on his own responsibility and without consulting Congress, compelled the Canal Commissioners to resign, and appointed Judge Magoon as Governor of the Canal Zone with powers little short of autocracy. Under Gorgas and Magoon, the known measures against the mosquito were remorselessly put into force. Every house in Panama was disinfected, stringent measures were taken for the early recognition of cases of yellow fever and malaria, and every inhabitant of the city was inspected by a physician once a day. In addition, the breeding-places of mosquitoes were actively treated, water-tanks and cisterns cleaned and covered in, and a pipe-supply installed. This was in May. The last case of yellow fever occurred in Colon on August 27th and in Panama on Sept. 14th. In October Gorgas and Magoon offered a sum of $50 in gold to any person, not a member of the health department, notifying a case of yellow fever in the Canal Zone. There is no record that any award was made.

In 1913–14, responding to an invitation from the Chamber of Mines at Johannesburg, he made an important investigation into the high death-rate from pneumonia among the native miners on the Rand. Subsequently one of his chief assistants at Panama was offered the post of advisory medical officer to an important group of mines, an appointment which he still holds with excellent results. Two years later found General Gorgas occupied with a survey of the endemic foci of yellow fever in the southern continent of America. During the war he went to Serbia with the Rockefeller Antityphus Mission, and later helped to organise the arrangements for the hygiene of the American Army.

General Gorgas received many official acknowledgements of his work; he was made honorary D.Sc. of several American universities, and, in 1914, of the University of Oxford. The K.C.M.G., his most recent honour, was received from the King personally on June 8th, when he was on his sick-bed.

The reputation of Gorgas as a scientist has been challenged in certain quarters, in view of the fact that he was not responsible for the actual discoveries without which his work could not have been done. For this he needs no defence. Science and art are at their greatest when they join hands, and the man who acts as a link between discovery and its application needs a combination of qualities as rare as those of the pure investigator. It has been too much the pride of the seeker after abstract truth in the exact sciences to care little as to its application. But even when research has been undertaken with the sole aim of finding the cause of an endemic fever or the source of an infection, the successful investigator would often cut a poor figure as the organiser of an expedition to stamp out the scourge in the light of his discoveries. It is not only as a scientist but as a leader of men, as a hero of at least two of the most successful campaigns ever waged, that the name of Gorgas will always be gratefully remembered. The formal procession with the body from Millbank under military escort to St. Paul's, and the ensuing ceremony in the Metropolitan Cathedral, are evidences of the reverence due to a great benefactor of humanity, which in this case are amply called for.

MONTAGU HANDFIELD-JONES, M.D. LOND., F.R.C.P. LOND.,

CONSULTING OBSTETRIC SURGEON TO ST. MARY'S HOSPITAL.

Dr. Handfield-Jones, who died on July 2nd at the age of 65 from heart failure, had been in declining health for some time. Born in 1855, he was the eldest son of Dr. Charles Handfield-Jones, F.R.S., and was educated at Rugby and at London University. As a student at St. Mary's Hospital he showed great promise, winning a scholarship in natural science and an exhibition in classics and mathematics. He qualified in 1879 with the L.R.C.P. and M.R.C.S. Eng., and was subsequently appointed assistant surgeon to St. Mary's Hospital and lecturer on midwifery and diseases of women, and later obstetric surgeon, a post which he held up to a few years ago, when he became consulting obstetric surgeon. Four years after qualifying he graduated M.B. at the University of London, taking honours in obstetric medicine, and in the same year became a Member of the Royal College of Physicians of London. He proceeded to the M.D. Lond. in 1886, and became a Fellow of the Royal College of Physicians of London in 1900. Dr. Handfield-Jones examined in midwifery for the Conjoint Board and for the Universities of Cambridge, London, and Manchester. He was consulting obstetric surgeon to the Paddington Dispensary and surgeon to in-patients at the British Lying-in Hospital. He was at one time president of the Obstetrical and Gynæcological Section of the Royal Society of Medicine, and at another president of the Harveian Society. In 1895 he delivered the Harveian lectures on the Heart in its Relation to Pregnancy, Parturition, and the Puerperal State.

In Dr. Handfield-Jones the profession has lost an acknowledged leader, and a sound exponent of his particular branch of our science.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Treatment and Training of Disabled Men.

Colonel J. S. BOSTOCK, R.A.M.C., Director of the Treatment-Training Branch of the Medical Services Division of the Ministry of Pensions, gave evidence before the Select Committee of the House of Commons on Pensions on Wednesday, June 30th. Colonel BOSTOCK said that the question whether a man was suitable for training under ordinary industrial conditions under the Ministry of Labour or Ministry of Agriculture, &c., or for a course of concurrent treatment and training under the Ministry of Pensions, was determined by medical examination carried out by a medical referee, or a medical board, or the medical officer of a Ministry of Pensions hospital or clinic. Disabled men of the following classes fell to be dealt with by the Ministry of Pensions: (*a*) Men requiring treatment such as would interfere with regular attendance at a continuous course of training on ordinary industrial lines; (*b*) men who were likely to break down or had broken down in training or employment under ordinary industrial conditions; (*c*) men whose condition necessitated concurrent treatment and training in a convalescent centre; and (*d*) men whose disability was such as to make it impossible or undesirable for them to be trained or employed in association with ordinary workmen—e.g., cases of severe facial injury, blindness, or deafness. Cases of men who broke down during a course of training under the Ministry of Labour were transferred to the Ministry if the medical referee was of opinion that treatment was needed for a longer period than three weeks. Under existing arrangements the provision of training, which cannot safely be dissociated from treatment, for tuberculous men (not officers) was a matter for the Ministry of Health, the department at present responsible for the treatment of such cases. Cases requiring concurrent treatment and training were, generally speaking, dealt with either in (*a*) convalescent centres, or (*b*) orthopædic, neurasthenic, and other hospitals. Men were eligible for admission to a convalescent centre if they were suffering from a disability attributable to, or aggravated by, service, and were medically certified to be either unfit to follow their pre-war occupations or unable to follow them without diminution of earning capacity. Medical treatment was prescribed by medical officers resident at the centre, and carried out under their supervision. Nursing and massage services were available. Sick quarters for temporary cases of illness or cases requiring medical observation were provided. The centre also included a dispensary and a large massage room fitted up with modern electrical and other apparatus. The amount of training for which a man was capable was regulated in accordance with his physical ability and was determined by a medical officer. In no case was training carried out at the expense of treatment, which was the primary consideration. The training was in the hands of expert instructors under the supervision of an experienced chief training officer. The training was both theoretical and practical in character. The Treasury had sanctioned the provision of 3300 places in convalescent centres as follows: England, 2500 places; Wales and Scotland, 600 places; Ireland, 200 places. Several of the Ministry's hospitals were equipped with a limited number of workshops in which elementary training of various kinds was given to all cases susceptible of training. The training at these hospitals was mainly of a curative or occupational character, but in some cases it formed the basis of vocational training which was continued as soon as the man was fit to leave hospital, either at a convalescent centre or in a course under the Ministry of Labour. Some of these workshops were in being at the time of the transfer of the hospitals from the War Office; in other cases the training facilities had been provided by the Ministry.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 30TH.

Nurses' Leave in Egypt.

Major BIRCHALL asked the Secretary for War whether there were a number of nurses stationed at the 24th Stationary Hospital, Kantara, Egypt, who had been in Egypt for more than three years without leave and whose contracts had expired; and whether arrangements could be made to bring them home.—Mr. CHURCHILL replied: I have called for a report and will write to the honourable Member as soon as it is received.

Nurses' Pensions in India.

Mr. CAMPBELL asked the Secretary for India if he could state when the revised scale of pensions for officers of the Indian Army departments, lady nurses of Queen Alexandra's Military Nursing Service for India, and for officers of the Royal Indian Marine would be issued.—Mr. MONTAGU replied: The revision of the pensions of the classes referred to is still under consideration, and it is hoped that a decision will be come to shortly.

Scheme for Training Ex-Soldiers.

Mr. LAWSON asked the Minister of Labour whether he would issue a White Paper showing the details of the scheme for training ex-soldiers and setting forth the allowances received by the men at each stage of training.—Dr. MACNAMARA replied: Yes, Sir; I think the suggestion a good one and will forthwith prepare and lay a paper as my honourable friend asks.

Report on Slum Areas.

Lieutenant-Colonel FREMANTLE asked the Minister of Health if and when he would publish the report of the Slum Areas Committee and would say what action he proposed to take on its recommendations.—Dr. ADDISON replied: The interim report of the Committee dealing particularly with the London problem has already been published. The honourable and gallant Member will appreciate that save in so far as reconstruction is possible without material displacement of the population it is unfortunately not practicable to deal on a large scale with slum areas, except in the way of preparing the schemes, until much more progress has been made in providing new houses, which is an additional reason why it is important that the London County Council should press forward with all dispatch with their big housing schemes.

Habitable Houses in London.

Mr. BRIANT asked the Minister of Health if he would state what was the number of empty houses in London fit for habitation at the last available date.—Dr. ADDISON replied: I regret that I am not in a position to give precise information, and I will communicate with my honourable friend in regard to it. I may mention, however, that last year inquiries were made as to empty houses in London and neighbourhood which might be suitable for conversion; that 4300 houses of this kind were considered; that a large number of these houses soon became occupied; and that of the remainder only a small proportion were found to be suitable for conversion.

Colonial Medical Service Report.

Lieutenant-Colonel FREMANTLE asked the Under Secretary for the Colonies if and when he would publish the report of the recent committee appointed to inquire into the conditions of the Colonial Medical Service; and would he say what action he proposed to take on the recommendations of the report.—Lieutenant-Colonel AMERY replied: The com-

mittee referred to has not yet presented its report, and until the Secretary of State has received the report and had an opportunity of considering it, it is not possible to say what action will be taken or whether it will be published.—Lieutenant-Colonel FREMANTLE: When is that report likely to be actually delivered?—Lieutenant-Colonel AMERY: I think it will be very soon. I believe it is being printed at this moment.

THURSDAY, JULY 1ST.

Third London General Hospital.

Sir HENRY HARRIS asked the Minister of Pensions whether the Third London General Hospital, which was to be closed on July 31st, had been offered to the Ministry of Pensions and declined; and whether he would state the number of war pensioners now receiving treatment in civil hospitals.—Mr. MACPHERSON replied: The hospital referred to has been offered to the Ministry, but the accommodation was considered less suitable to the requirements of the Ministry than that of another hospital the transfer of which to the Ministry is being considered. The number of war pensioners now receiving treatment in civil hospitals is approximately 15,000.

Reorganisation of Enfield Cottage Hospital.

Mr. ANEURIN WILLIAMS asked the Secretary to the Treasury whether the trustees of the Enfield Cottage Hospital, the only voluntary hospital in the district, decided last December, in view of its serious financial position, to approve its transfer to the Enfield War Memorial Committee for reorganisation under a new board of management representing the public interests of the whole district; whether this proposed transfer had since then been awaiting the approval of the Charity Commissioners; whether the long delay in completing the transfer was preventing the necessary public appeal for the funds which were so greatly needed; and whether, in view of the very critical situation and the threatened closing of the hospital, the Charity Commissioners would give their sanction to the proposed arrangements without further delay.—Mr. S. BALDWIN replied: The reparation of the scheme for the transfer referred to has been delayed owing to uncertainty as to the intentions of the War Memorial Committee, and to differences of opinion in the locality as to what was required. A scheme has now been drafted, and a print will shortly be in the hands of the War Memorial Committee.

Small-pox in Glasgow.

Mr. ROBERT YOUNG asked the Secretary for Scotland whether any other measures had been taken in Glasgow besides removal to hospital of cases, isolation of contacts, and free vaccination, to deal with the small-pox outbreak; and, if so, what were these measures.—Mr. MUNRO replied: The main additional measures taken by the Public Health Authority of Glasgow are: house-to-house visitation in infected areas; daily visitation of contacts during the incubation period; attention to general sanitation and public cleanliness; disinfection of houses, clothing, and bedding, of cases and contacts; and daily disinfection of tram-cars. In addition, every effort has been made to trace source of infection in every known case.

Medical Examination of Women Pensioners.

Dr. DONALD MURRAY asked the Minister of Pensions whether cases had occurred in which women, on applying for pensions on the ground that they had been deprived of the support of a male relative killed in the war, had been called upon to undergo medical examination in order that their fitness to go out to work might be tested; and, if so, whether he would give instructions for this procedure to be discontinued.—Mr. MACPHERSON replied: My honourable friend probably has in mind those pensions to dependents which are under the Royal Warrant conditional upon the existence of incapacity of self-support through infirmity or age. Where the evidence on this point is open to doubt it is the practice to ask for a medical certificate, which is ordinarily given by the applicant's usual medical attendant. I do not consider that this procedure entails any hardship or calls for revision.—Dr. MURRAY: In the case of a mother whose son contributed to the family exchequer and has been killed, is the policy of the Department to see that the woman is medically examined and certified as fit for work?—Mr. MACPHERSON: My honourable friend is misrepresenting the answer which I gave. There is no desire on the part of the Ministry of Pensions to produce hardship, but in a case where a woman is able to do work my honourable friend will agree that it would be right that we should ask whether she is fit to do work or not. The appropriate way to do that is to ask for a certificate from her own family attendant.

Aged Persons and Sickness Benefit.

Mr. CHARLES EDWARDS asked the Minister of Health whether he would introduce legislation so as to amend the National Insurance Act, 1911, with a view to allowing persons who had been contributors under the Act, and had attained the age of 70 years, having the same benefits of the Act during sickness as persons who had not attained that age.—Dr. ADDISON replied: The extension of sickness and disablement benefits to persons over 70 years of age would necessitate an increase in the contributions payable by all insured persons throughout the whole period of their insurance, and the only persons who would derive any advantage from such increase would be the very small proportion of insured persons who continue in employment up to or beyond the age of 70. The suggested extension would also involve great administrative difficulties, as in the case of the aged incapacity for work through sickness is not distinguishable from infirmity due merely to old age. The experience of Friendly Societies has shown that the risk in question is not one which can properly be covered by insurance, and provision for the needs of aged persons is already made under the Old-age Pension scheme, in which no consideration of incapacity for work is involved. As at present advised, I do not therefore propose to introduce legislation on the lines suggested by the honourable Member.

MONDAY, JULY 5TH.

Registrars of Births.

Dr. MURRAY asked the Secretary for Scotland whether town councils had power to draw up rules and conditions for the registrars of births, and if they did, under what authority did they act, and what power of enforcement did they possess; and were registrars of births appointed during the pleasure of town councils, or could any condition of this kind be made at the time of the appointment.—Mr. MURRAY (Solicitor-General for Scotland) replied: The powers of town councils in this matter are contained in the Registration of Births, Deaths, and Marriages (Scotland) Acts, 1854 and 1856. These Acts provide for the election of registrars by town councils, regulate the tenure of office, the registrar being removable by the sheriff moved thereto by the town council, or by the Registrar-General, and provide for the remuneration of registrars. Registrars act in the performance of their duties under the direction of the Registrar-General, and are under the general control and superintendence of the sheriff.

TUESDAY, JULY 6TH.

Speed Limit of Motor Vehicles.

Mr. RAPER asked the Secretary for the Home Department if he could now see his way to give instructions for the speed limits on motor vehicles to be increased, in view of the great improvements made in their braking capacity since the introduction of the speed regulations now in force.—Mr. NEAL (Parliamentary Secretary to the Ministry of Transport) replied: An alteration in the maximum speed for motor-cars would require fresh legislation. The whole question of speed limits for motor vehicles generally is within the terms of reference of the Departmental Committee on the Taxation and Regulation of Road Vehicles, and I cannot anticipate their report or the legislation which may follow it.

Tetanus in the Former Wars.

Mr. ROBERT YOUNG asked the Secretary for War if he would state what was the attack-rate and death-rate per 1000 wounded men from tetanus in the South African war, the Russo-Japanese War, the Crimean War, and the Franco-Prussian War.—Mr. CHURCHILL replied: There were 6 cases of tetanus among other ranks wounded or injured in action during the South African War, or an attack-rate of 0·28 per 1000; and 3 deaths, or a death-rate of 0·14 per 1000. There were no cases of tetanus among officers. No statistics regarding tetanus are available in the War Office for the other wars mentioned.

EXTENSION OF THE WINSLEY SANATORIUM.—At the last meeting of the Executive Committee of the Winsley Sanatorium, near Bath, it was decided to extend the building by the addition of 45 extra beds and the provision of a house for the senior resident medical officer. The institution will in the future accommodate 160 patients. The chairman (Alderman H. Anstey) expressed regret at the resignation of Mr. H. W. M. Rees, the medical superintendent, and on behalf of the governors alluded with warm appreciation to his valuable services to the sanatorium.

COMMITTEE ON MEAT INSPECTION.—The Ministry of Health announces the appointment of a committee, with Sir H. C. Monro as chairman, to consider and report on the legislative and administrative measures necessary to secure adequate protection for the health of the people in connexion with the slaughter of animals and distribution of meat for human consumption in England and Wales. The medical members of the committee include Dr. W. J. Howarth and Dr. A. W. J. MacFadden, and Mr. T. Parker, F.R.C.V.S., represents veterinary surgery. Mr. F. H. O. Jerram, of the Ministry of Health, has been appointed secretary, and communications for the committee should be addressed to him at the Ministry of Health, Whitehall, London, S.W. 1.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Fellows of the College was held on July 1st to elect three members of the Council. Sir George Makins, the President, was in the chair. The result was as follows:—

	Votes.	Plumpers.
Sir Anthony Bowlby	473	9
Sir D'Arcy Power	383	3
F. J. Steward	329	58
W. Thelwall Thomas	240	22
Victor Bonney	190	17
J. H. Fisher	180	28
H. S. Pendlebury	167	11

The President declared that Sir Anthony Bowlby and Sir D'Arcy Power had been re-elected and that Mr. Steward had been elected members of the Council. There were 778 postal votes and 6 Fellows voted in person. Mr. H. J. Price, of Maldon, and Mr. Willmott Evans acted as scrutineers.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Second Professional Examination, held on June 24th, 25th, 28th, and 29th, the following candidates were approved:—

Part I., Anatomy and Physiology.—C. C. P. Anning, Cambridge; J. M. Bailey, St. Thomas's; S. C. Bakhle, F. J. Biddle, and W. G. Booth, Guy's; C. Brameld, Leeds; E. T. Brice, Middlesex; V. R. de Boissière, Guy's; Gertrude Magdalen de Souza, Madras and London Sch. of Med. for Women; W. de Soyza, Ceylon Med. Coll.; D. Diamond, St. Bart.'s; N. L. Eckhoff, Cape Town and Guy's; R. H. Enoch, Cardiff; Gwladys Evans, Cardiff; G. E. Fisher, Guy's; R. D. Flintan, Middlesex; L. Ghabrial, King's Coll.; A. Gordon, P. Hack, P. G. Harvey, and D. B. Hitchings, Guy's; S. J. Hoffman, Cape Town and Middlesex; M. Honigsberger and M. Jackson, Guy's; J. W. Joule, St. Bart.'s; D. Kostitch, King's Coll.; Catherine Emma Lilian Lendrum, London Sch. of Med. for Women; J. T. Linklater, Cape Town and Guy's; E. Liston, St. Bart.'s; C. R. McClure, London; L. Mather, Manchester; F. R. L. Miller and C. A. Moody, St. Bart.'s; A. L. te W. Naudé, St. Thomas's; E. Orsmond, Cape Town and Guy's; W. Parry-Jones, London; R. C. Peate, Middlesex; C. A. Probert, Guy's; F. R. Ratnagar, Bombay and Guy's; R. P. Rees, Middlesex; C. E. Roach-Smith, London; D. G. Robinson, Guy's; C. V. D. Rose, Univ. Coll.; M. Rose, Cape Town and Middlesex; A. B. Rufail, Cairo and King's Coll.; G. S. Sinnatamby, Ceylon Med. Coll.; A. W. L. Smith, Manchester; Betty Stainer, King's Coll.; S. S. Suzman, Guy's; B. M. Toop, London; M. Weinbren, Cape Town and Guy's; and D. B. Whitlock and H. J. F. Wood, Guy's.

Part II., Materia Medica and Pharmacology.—Annie Dorothy Allen, Liverpool; T. J. D. Atteridge, St. Bart's; H. P. Baylis, Guy's; W. Beaumont, London; W. G. Booth and A. Broido, Guy's; N. E. D. Cartledge, St. Bart's; H. V. Croucher, Guy's; A. Downes, St. Bart's; Winifred Phœbe Edmunds, King's Coll.; R. R. Foote, St. Bart's; M. Garfield, Univ. Coll.; J. P. Helliwell, St. Mary's; J. Herbert, Guy's; G. H. Hogben, St. Bart's; S. P. Jacobson, E. I. Liberman, and J. T. Linklater, Guy's; P. M. Lissack, St. Thomas's; S. F. Mina, King's Coll.; J. N. D. Paulson, St. Mary's; E. F. Peck, Liverpool and St. Bart's; T. H. I. Potts, Sheffield; F. L. Rayner, Guy's; R. P. Rees, Middlesex; J. W. Rigby, Sheffield; C. M. Scott, King's Coll.; A. W. L. Smith, Manchester; A. H. Talaat, Middlesex; D. D. C. Thomson, London; A. K. Wiggins, Middlesex; C. Woode, Charing Cross; and J. Woolff, St. Thomas's.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful in the subjects indicated:—

DOCTOR OF MEDICINE.

F. A. Bearn, S. L. Heald, N. T. K. Jordan, Harold Sheldon, and J. F. Ward.

FINAL M.B. AND CH.B. EXAMINATION.

Nooman Abddh, K. V. Deakin, Georgiana M. Duthie, F. R. Ferguson (distinction in Surgery and Obstetrics), Evelyn A. Garnett, F. G. Hamnett, Joshua Harris, Sylvia K. Hickson, Ernest Jones, F. C. Jones, J. N. Laing, H. A. Lomax, W. E. Mason (first-class honours, distinction in Medicine and Obstetrics), Doris B. Norman, Emily M. Peach, Gerald Sheehan, Constance Snowdon, Annie E. Somerford, G. L. Taylor (distinction in Surgery), Mary I. Turner, F. A. van Coller, and J. B. Wright.

Medicine and Obstetrics.—May Blakiston, J. W. Crawshaw, A. M. El-Aguizy, and Henry Tomlinson.

Surgery.—F. H. Anderson and Percival Fildes.

Medicine.—Irma M. C. Jehansart.

Obstetrics.—H. W. Taylor.

Forensic Medicine and Toxicology.—G. V. Ashcroft (distinction), E. C. Berg, Nancy E. Bleakley (distinction), Muriel Coope, T. E. Coope, Eugenia R. A. Cooper, S. W. Drinkwater, Winifred M. Edghill, T. N. Fisner, Kathleen M. Fullerton, Edward Gleaves, Florence M. A. Graham, W. H. Gratrix, Albert Haworth, Ruth Hill, C. D. Hough, Violet M. Jewson (distinction), Marguerite F. Johnstone, Jessie Kilroe, A. W. Kirkham, R. R. Lane, James Leather, G. H. Lees, Eva G. Le Messurier, W. L. Martland, P. B. Mumford, Terence O'Brien, L. S. Potter, W. E. Powell, Margaret Pownall, Bertha Renshaw, H. L. Sheehan, Florence G. Sherry, Margaret Single, J. W. Smith, Harry Stafford, Doris A. Taylor, S. N. Taylor, Norah M. Walker, Solomon Wand, Sidney Waterworth, Robert Williamson, and J. R. Wright.

THIRD M.B. AND CH.B. EXAMINATION.

Pharmacology, Therapeutics, and Hygiene.—P. D. Abbatt, Reginald Anderton, J. H. Appleton, Mary W. Atkinson, Elsie C. Begg, J. B. Bennett, Doris H. Bentham, Benjamin Broman, G. H. Buckley, Vincent Chadwick, E. W. Clough, H. M. Coope, N. S. Craig, O. M. Duthie, Kathleen M. Eastwood, Beatrice L. Ellison, H. E. Emmett, Caroline M. Edwards-Evans, J. H. Fletcher, William Geraghty, Doris M. Hardman, Arthur Ingham, E. L. Jones, Mary Kent, G. L. Meachim, Nora Mills, Winifred H. Mitchell, A. C. Newman, A. A. Pomfret, Hilda Pratt, G. T. Robinson, Abram Rosenstone, Ragheb Salib, Eleanor P. Smith, Henry Southworth, G. B. Stenhouse, J. H. Struthers, Leo Unsworth, Emmeline Wade, C. B. V. Walker, Margaret Wild, S. J. Woodall, James Worthington, and James Yates.

Hygiene.—Margaret Derbyshire, Gwendolen A. G. Edwards-Evans, F. W. W. Fox, C. B. Kirkbride, G. A. Lord, Dorothea A. C. Partington, and Margaret J. Warburton.

DIPLOMA IN DENTISTRY.

Final Examination.—A. L. Craggs, H. B. Ivers, E. B. Manley, V. W. Morse, H. A. Parkinson, Matthew Raeside, and Alice Ramsdem.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful:—

DEGREE OF M.D.

G. H. Darlington, P. E. Gorst, Mary E. Illingworth, Phoebe A. Ince, S. D. McAusland, F. C. Plummer, H. G. Roberts, J. F. Roberts, R. E. Roberts, M. B. Strock, and W. R. Williams.

DEGREES OF M.B. AND CH.B. (HONOURS).

Class I.—W. J. Birchall (with distinction in Obstetrics and Medicine).

FINAL EXAMINATION FOR M.B. AND CH.B. DEGREES.

Part I., Pathology.—J. L. Armour, A. V. Campbell, C. H. R. Carmichael, E. N. Chamberlain, Florence M. E. Davies, Helen M. Duvall, F. H. Edwards, M. H. Finegan, W. M. Frazer, P. R. Hawe (with distinction), A. R. Jones, R. M. Jones, C. L. Kopeland, Beatrice M. Niven, and C. Voigt.

Part II., Forensic Medicine, Toxicology, and Public Health.—O. A. Akjaly, F. H. Alexander, *† G. P. F. Allen, *†J. L. Armour, *†J. R. Bhatia, J. S. Bradshaw, †Doris Brown, †W. E. A. Burton, †Doris M. Cassady, †Mildred M. Clegg, *R. W. Cowie, †A. C. Crawford, †Gladys W. Darlington, †I. S. Fox, †W. M. Frazer, †G. L. Gately, W. S. Gilmour, J. Goldberg, *† S. B. Herd, G. M. Hughes, Isabel E. Imison, E. W. Johnson, Isobel K. Johnstone, *R. J. Jones, Irene E. Kenworthy, A. Livingston, F. Q. McKeown, H. R. Madan, †R. F. J. Martin, †J. H. Moorhouse, M. Newman, †J. B. Oldham, †G. W. Phillips, †Kathleen M. Platt, J. H. Pottinger, †A. McK. Reid, J. K. Reid, †T. R. Roberton, Gladys Rutherford, C. F. H. Sergeant, F. C. H. Sergeant, S. G. Sheir, *†S. S. Shrikanth, W. T. de V. Thomson, *L. F. Unsworth, *†S. V. Unsworth, †C. A. Wells, and *†T. A. Williams.

* With distinction in Forensic Medicine and Toxicology.
† With distinction in Public Health.

Part III., Medicine, Surgery, and Midwifery.—Esther Ashworth, Evelyn F. Bebbington, G. N. Campey, J. Flanagan, R. O. Jones, T. M. Jones, D. M. Mather, Annie A. Muir, G. H. Potter, Edith M. Seward, Marguerite G. Sheldon, Nellie Wall, and D. O. Williams.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At examinations held recently the following candidates were successful:—

THIRD EXAMINATION FOR DEGREE OF BACHELOR OF MEDICINE.

Materia Medica, Pharmacology, and Pharmacy; Public Health; Medical Jurisprudence; Pathology and Elementary Bacteriology.—Sarah Bruce Allan, Alan Angus, Siegfried Annecke, Thomas Henry Bates, Hugh Moray Sutherland Blair, Cecil Colville Carr, Evangeline Carse, James Ferens Coltman, Roy Neville Craig, Walter Nigel Crowe, Richard Leslie Dagger, Robert Alexander McKinnel Dickson, Edgar Reginald Dingle, Hubert Breffit Leaster Dixon, Giles Arthur Michael Hall, Geoffrey Arthur Haydock, Reginald Hickley, Rev. Eustace Vernon Howard, Leonard Hunter, Ella Keidan, Elizabeth Killian, Mona Kirkhouse, Hilda Lodge, Ettie Ormsby McCullagh, Mary Josephine McManus, Abraham Jacob Moskow, Una Mary Mulvany (second-class honours), Peter Murphy, Patrick Joseph O'Connell, Leo Norton Knight O'Neill, Frederick William Markham Pratt, Jacob Victor Reuben, Adéle Constance Robson, Jessie Evelyn Sheret, George Wilson Spark, Gladys Stableforth, Thomas Symington Storey, Weldon Patrick Tyrone Watts, James Whillis, George Wilson, and Henry Arthur Wilson.

UNIVERSITY OF BRISTOL.—At examinations held recently the following candidates were successful:—

THIRD EXAMINATION FOR DEGREE OF B.D.S.

George Norman Season.

THIRD EXAMINATION FOR DIPLOMA IN DENTAL SURGERY.

William Bayly, Leslie Clifford Bodey, Evan Elwyn Lewis, and John Christopher Leslie Phillips.

UNIVERSITY OF ST. ANDREWS.—At examinations held recently the following candidates were successful in the subjects indicated:—

THIRD PROFESSIONAL EXAMINATION FOR DEGREES OF M.B., CH.B.

Materia Medica.—James C. Anderson, Archibald J. Campbell, Cora C. Campbell, David A. H. Cassells, David C. Clark, George R. M. Cordiner, James Craigie, William M. Cumming, Jean M. Davidson, Violet C. Dobbie, William S. D. Elder, Ruby N. Foggie, Charles R. Henderson, Mary M. Jack, William L. Kinnear, Norah M. Lindberg, Annie T. McDonald, Norman McLeod, Jeannie H. Morton, Margaret C. Muir, Janet L. A. Muirhead, Robert Norrie, Sydney S. Ogilvie, John E. Overstead, Alan Pride, Alexander B. Richardson,

Nora A. M. Rodger, Agnes T. H. Shepherd, Lucy C. Simpson, Bhagwant Singh, Edith M. D. Smith, Janet O. Stephen, Arthur K. Tateson, Frances H. Watson, and Thomas Wilson.

Pathology.—Frank E. Anderson, James C. Anderson, Cora C. Campbell, David A. K. Cassells, David C. Clark, George R. M. Cordiner, James Craigie, William M. Cumming, Jean M. Davidson, Violet C. Dobbie, William S. D. Elder, Rubie N. Foggie, Penuel C. Grant, Charles R. Henderson, Mary M. Jack, William L. Kinnear, Norah M. Lindberg, Norman McLeod, Jeannie H. Morton, Margaret C. Muir, Janet L. A. Muirhead, Robert Norrie, Sydney S. Ogilvie, Alan Pride, Alexander B. Richardson, Nora A. M. Rodger, Agnes H. T. Shepherd, Lucy C. Simpson, Bhagwant Singh, Edith M. D. Smith, Arthur K. Tateson, William Thomson, William L. Tullis, Frances H. Watson, and Thomas Wilson.

Medical Jurisprudence and Public Health.—George G. Buchanan, Thomas K. Buchanan, Katharine M. Campbell, Georgina S. Craig, David W. Dawson, William S. D. Elder, Vyvyan S. Ewing, Harry Fisher, Phyllis Fleming, Annie A. Fulton, Alexander H. Harkens, Lazarus Jacobs, Isabella D. Kilgour, Nona S. Lesslie, Katharine D. Macfarlane, Elizabeth W. MacVicar, Isobel M. Mansie, John E. Overstead, Ronald S. Paton, John D. Stewart, Christina J. Thomson, Margaret L. Tod, William L. Tullis, and Margaret H. R. Young.

FOURTH PROFESSIONAL EXAMINATION FOR DEGREES OF M.B., CH.B.

Medicine.—Bessie M. Davidson, Mary Ellison, Frances L. Knipe, Margherita M. Lilley, Christian E. Little, John B. Macdonald, George J. Murray, William G. Robertson, Myles M. Stewart, Eleanor C. Thistlethwaite, Amelia M. Thoms, and Olive M. Whyte.

Surgery.—Bessie M. Davidson, Mary Ellison, Christian E. Little, William G. Robertson, Myles M. Stewart, Eleanor C. Thistlethwaite, Amelia M. Thoms, and Olive M. Whyte.

Midwifery.—Bessie M. Davidson, Mary Ellison, Frances L. Knipe, Margherita M. Lilley, John B. Macdonald, William G. Robertson, Myles M. Stewart, Eleanor C. Thistlethwaite, Amelia M. Thoms, and Olive M. Whyte.

THE price of Colonel L. W. Harrison's "Manual of Venereal Diseases," published by the Oxford Medical Publications, is 16*s*. net, and not as given in our issue of June 19th.

THE ELIZABETH GARRETT ANDERSON HOSPITAL.—The sum of £50,000 for the endowment of 50 beds at this hospital has now been acquired, and the services of Lady Hall, the chairman of the Appeal Committee, have been commemorated in the naming of one of the wards of the hospital now to be called the Sophy Hall Ward.

RONTGEN SOCIETY.—A special meeting of this society will be held on Thursday, July 15th, at 9 P.M., at University College, Gower-street, London, W.C., when an address will be delivered by Dr. W. D. Coolidge, of the Research Laboratories, General Electric Company, Schenectady, New York. Members of medical and scientific societies are invited to attend.

LONDON HOSPITAL MEDICAL UNIT.—A course of 12 lectures on neurology, open to students and graduates of the London Hospital and other schools, is being given on Tuesdays and Wednesdays from July 13th to August 18th at 2 P.M. in the clinical theatre of the London Hospital by Dr. Theodore Thompson, physician to the hospital, and Dr. George Riddoch, of the Medical Unit. The subjects will be announced in our medical diary.

A Summer School of Civics will be held at High Wycombe from July 31st to August 14th. Particular attention will be given to the needs of teachers of civics and of social workers in health and educational movements. Special courses will be provided on the welfare of infants and young children and experiments in the use of leisure. The lecturers will be Dr. Eric Pritchard, Miss Margaret Macmillan, Mr. Wilfred Buckley, Miss Norah March, and Mr. F. H. Haywood. Full particulars may be had from the secretary, Summer School of Civics, Leplay House, 65, Belgrave-road, London, S.W.1.

A SPECIAL post-graduate course will be held at the North-East London Post-Graduate College, Prince of Wales's General Hospital, Tottenham, N., in connexion with the Fellowship of Medicine and Post-Graduate Medical Association, from July 19th to 31st. The fee for the course, to those not Members of the Fellowship of Medicine, is 3 guineas, or 2 guineas for either week. Names of those wishing to attend should be sent not later than July 15th to the Dean at the Hospital (or at 19A, Cavendish-square, W. 1), or to the Secretary of the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

ITALIAN CONGRESS OF MEDICAL RADIOLOGY.—A Congress under the auspices of the Società Italiana di Radiologia Medica will be held from Oct. 28th to 30th at the R. Istituto di Elettroterapia e Radiologia Medica al Policlinico Umberto I., Rome. Professor Francesco Ghilarducci will preside over the Congress and the secretaries are Dr. Eugenio Milani and Dr. Sordello Aittilj. Those who intend to participate are asked to communicate with the secretaries at the address of the Congress before Sept. 15th.

PUBLIC MEDICAL SALARIES IN SOUTHAMPTON.—A combined meeting of members of the Southampton British Medical Association, Medico-Political Union, Medical Society, Public Medical Service, Local Medical and Panel Committees was held at the Royal South Hants and Southampton Hospital on Wednesday, June 23rd, and was largely attended. The meeting was called for the purpose of discussing the remuneration paid to public medical officials in the borough. Strong comment was made on the totally inadequate salaries which the meeting considered were being paid to the medical officers working for the Southampton Borough Council, and it was unanimously resolved to send a letter to the Council asking for an increase in the salaries by at least 50 per cent. on the following grounds:—

1. The great depreciation in the value of money and the increased cost of living.
2. The increasing importance and responsibility of their work.
3. Fees in other branches of medical work have been raised from 50 to 100 per cent.—e.g., panel practitioners, Seamen's National Insurance, National Deposit Friendly Society, &c.
4. Many other Councils pay better salaries to their medical officers than Southampton does.
5. The remuneration of officials in other professions has been raised.
6. Your medical officers have no pensions, and unless their salaries are sufficient to allow them to save they will have nothing to live on when they retire.

The letter points out that owing to the increase in the number of junior posts in the public health service only a small percentage of men can expect to attain to the position of principal medical officer of health, and unless salaries are raised very materially this is bound eventually to cause a diminution in the number of men and women entering the service, with consequent loss of efficiency.

CONGRESS OF THE ROYAL SANITARY INSTITUTE.—This Congress will be held in Birmingham from July 19th to 24th, under the presidency of Lord Astor, Secretary to the Ministry of Health, who will deliver the inaugural address at the Birmingham and Midland Institute on July 19th at 8 P.M. Besides the sectional meetings and conferences special lectures will be delivered by Sir Frederick Mott and Dr. Andrew Balfour. At the Birmingham and Midland Institute Sir Frederick Mott will lecture on Body and Mind on July 20th, at 8 P.M., when Dr. C. Grant Robertson will preside. Dr. Andrew Balfour will give a popular lecture, illustrated by lantern slides, on Links with the Tropics, at the same Institute, at 7.30 P.M. on July 22nd. The Section of Sanitary Science and Preventive Medicine will meet on July 20th and 21st, under the presidency of Sir Robert H. Firth, and the subjects to be discussed include Mental Defectives, Production of Clean Milk, the Falling Birth-rate, Malaria, Disinfectants, Influenza, Pneumonia and Allied Epidemics. The Section of Engineering and Architecture—over which Mr. W. E. Riley, late superintending architect to the London County Council, will preside—will be devoted mainly to discussions on Housing, Urban and Rural, Reconstruction of Slums, School Buildings, House Drainage, and River Pollution, and will meet on July 22nd and 23rd. The Section of Hygiene of Maternity and Child Welfare will be presided over by Lieutenant-Colonel F. E. Fremantle, and will deal with the Still-birth Problem, Teaching of Sex Hygiene, Infant Welfare Work, and Recreation of Children. This section will meet on July 22nd and 23rd. Councillor Mrs. George Cadbury will preside over the Section of Personal and Domestic Hygiene, which will meet on July 21st, and will consider Choice and Storage of Foods, Child Hygiene and Physical Culture. The Section of Industrial Hygiene, under the presidency of Mr. Neville Chamberlain, M.P., will discuss Industrial Efficiency and Fatigue, Welfare Work in Factories, and the Health of Seamen. Technical conferences have been arranged in connexion with the Congress, and will include meetings of (1) representatives of sanitary authorities, (2) medical officers of health, (3) engineers and surveyors to county and other sanitary authorities, (4) veterinary inspectors, (5) sanitary inspectors, (6) health visitors, (7) rat officers. All sectional meetings and conferences will be held at the University of Birmingham. A health exhibition will be held at Bingley Hall in connexion with the Congress, where the work of the Birmingham Corporation departments is to be illustrated. Delegates are expected from public departments in England, Scotland, and the overseas dominions, from Denmark, France, Holland, Sweden, and from some 600 English boroughs. Fellows, Members, and Associates of the Institute will be supplied with tickets for the Congress on application to the secretary, and tickets will be obtainable at a reception room at the Town Hall, Birmingham, during the meeting. Those not connected with the Institute can obtain Congress tickets (£1 1*s*., ladies' tickets, 10*s*. 6*d*. each) up to Friday, July 16th, at the offices of the Institute, 90, Buckingham Palace-road, London, S.W.1., and after July 17th in a reception room in the Town Hall.

TYPHUS IN EASTERN EUROPE.—With the support and coöperation of the Secretariat of the League of Nations a Chadwick public lecture on "Health Conditions in Eastern Europe—Typhus a Serious Menace," will be given on Thursday, July 15th, at 5.15 P.M., by Dr. Norman White, Medical Officer of the Ministry of Health, acting as Medical Commissioner, Typhus Commission, League of Nations, in the Large Hall of the Surveyors' Institution, 12, Great George-street, Westminster, Sir William J. Collins in the chair.

THE British Orthopædic Association has unanimously elected King Manuel an honorary member in acknowledgment of his great services to the wounded soldier during the war, especially in the establishment of curative workshops in the special military surgical centres.

THE FEDERATION OF MEDICAL AND ALLIED SOCIETIES.—The annual meeting will be held at 11, Chandos-street, Cavendish-square, W., on Tuesday, July 27th, at 3 P.M. The annual report and balance-sheet will be received, the election of corporate members confirmed, and the officers and executive council for the ensuing year will be chosen. At the general meeting the work of the federation will be reviewed. The need for constructive effort by the medical and allied professions in the reorganisation of the medical services of the country will be emphasised by speakers among whom will be Lord Dawson and Captain W. E. Elliot, M.P.

WEST AFRICAN MEDICAL STAFF.—The following new scale of salaries has been approved:—

Medical Officers: Commencing salary £660, rising by £30 annually to £720, then, subject to confirmation of probationary appointment £720, by £40 to £960, with "proficiency pay" of £72 a year drawn while in the Colony. Free quarters are provided and free passages as at present. Before proceeding beyond £800 officers are required to undergo an approved course of post-graduate instruction.

Senior Medical Officers: £1000, by £50 to £1150, with £100 proficiency pay. Medical officers who have served for three years at the maximum of the lower grade may, if recommended, draw salary as Senior Medical Officers.

Provincial Medical Officers: £1200, plus £240 duty allowance.

Deputy Principal Medical Officers: £1300, plus £260 duty allowance.

Principal Medical Officers: £1500, plus £300 duty allowance.

Director of Medical and Sanitary Services Nigeria: £1700, plus £340 duty allowance.

Sanitary Officers: £1050, by £50 to £1200, plus £210 duty allowance.

Senior Sanitary Officers: £1300, plus £260 duty allowance.

URBAN VITAL STATISTICS.

(Week ended July 3rd, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had declined from 13·8 to 10·1 in the seven preceding weeks, further fell to 9·9 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·0, or 1·3 per 1000 below that recorded in the previous week, while among the remaining towns the rates ranged from 1·1 in Eastbourne, 2·5 in Acton, and 5·2 in Ilford, to 15·6 in Gillingham, 17·3 in Aberdare, and 20·0 in Blackpool. The principal epidemic diseases caused 233 deaths, which corresponded to an annual rate of 0·7 per 1000, and comprised 88 from infantile diarrhœa, 50 from measles, 45 from diphtheria, 40 from whooping-cough, 8 from scarlet fever, and 2 from enteric fever. Measles caused a death-rate of 2·4 in Leicester and 3·0 in Wigan, but the mortality from the remaining diseases showed no marked excess in any of the towns. There were 1705 cases of scarlet fever, 1603 of diphtheria, and 3 of small-pox under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1646, 1668, and 3 respectively at the end of the previous week. The causes of 21 of the 3391 deaths in the 96 towns were uncertified, of which 5 were registered in Birmingham and 3 in Liverpool

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 12·7, 13·3, and 11·5 in the three preceding weeks, further fell to 11·1 per 1000. The 254 deaths in Glasgow corresponded to an annual rate of 11·9 per 1000, and included 9 from infantile diarrhœa, 5 from measles, 3 from small-pox, and 2 each from whooping-cough and diphtheria. The 63 deaths in Edinburgh were equal to a rate of 9·6 per 1000, and included a fatal case of infantile diarrhœa.

Irish Towns.—The 106 deaths in Dublin corresponded to an annual rate of 13·3, or 1·3 per 1000 below that recorded in the previous week, and included 3 from infantile diarrhœa, 2 each from measles and whooping-cough, and 1 from diphtheria. The 98 deaths in Belfast were equal to a rate of 12·4 per 1000, and included 3 from infantile diarrhœa and 2 from whooping-cough.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, July 15th.

DERMATOLOGY (Hon. Secretary—Henry MacCormac): at 5 P.M. *Cases* (at 4.30 P.M.):
Dr. Bunch: (1) Pemphigus; (2) Urticaria Pigmentosa.
Dr. Sequeira and Dr. Willcocks: Case for Diagnosis.
Dr. O'Donovan: Dermatitis from Acarine Parasite in Discarded Figs.

SOCIETY FOR THE STUDY OF INEBRIETY, in the Rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W.
TUESDAY, July 13th.—4 P.M., Discussion on Alcohol and Alcoholism in Relation to Venereal Disease, opened by Mr. A. Evans.

SEAMEN'S HOSPITAL SOCIETY, at the London School of Tropical Medicine, Endsleigh-gardens, N.W.
WEDNESDAY, July 14th.—2 P.M., Lecture:—Col. S. P. James: Prevention of Malaria.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, in the Barnes Hall, Royal Society of Medicine, 1, Wimpole-street, W. (by permission of the Royal Society of Medicine).
Short Film Demonstration illustrating Post-Graduate Teaching in Medicine, Surgery and its Specialties will be given on July 12th, by the Fellowship of Medicine, in conjunction with the British Film Institute. Open to all members of the Medical Profession.
MONDAY, July 12th.—5.30 P.M., (1) Dr. Howard Lilienthal: Splenectomy for Banti's Disease. (2) Dr. Charles H. Peck: Thyroidectomy. (3) Dr. Howard Lilienthal: Gastrostomy.

LONDON HOSPITAL MEDICAL COLLEGE.
MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.
A Course of Twelve Lectures on Neurology, open to Students and Graduates of the London Hospital and other Schools—
TUESDAY, July 13th.—2 P.M., Lecture I.:—Mr. Riddoch: Disorders of Function from Lesions of the Pyramidal Tract.
WEDNESDAY.—2 P.M., Lecture II.:—Dr. Thompson: Causes and Treatment of Hemiplegia.
SURGICAL UNIT, in the Units' Lecture Theatre, London Hospital, E.
Special Course of Lectures open to both Students and Post-Graduates.
Two Lectures on Coli Infection of the Kidney—
WEDNESDAY, July 14th.—4 P.M., Lecture I.:—Mr. F. Kidd.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, July 12th.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
TUESDAY.—2 P.M., Dr. Burnford: Visit to Medical Wards. 2.30 P.M., Mr. T. Gray: Operations.
WEDNESDAY.—2 P.M., Mr. D. Armour: Visit to Surgical Wards. 2.30 P.M., Mr. Addison: Operations.
THURSDAY.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2.30 P.M., Mr. T. Gray: Operations.
SATURDAY.—2 P.M., Dr. Beddard: Visit to Medical Wards.
Daily:—10 A.M., Ward Visits. 2 P.M., In-patient Clinics and Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, July 12th.—2.30 P.M., Mr. J. B. Banister: Gynæcological.
TUESDAY.—9.45 A.M., Lieut.-Col. R. H. Elliot: Selected Eye Cases and Operations. 2.30 P.M., Mr. C. H. Hayton: Laryngological; Dr. J. Metcalfe: Radiology.
WEDNESDAY.—2.30 P.M., Dr. W. J. Oliver: Dermatological.
THURSDAY.—2.30 P.M., Mr. N. Fleming: Ophthalmological. Dr. J. Metcalfe: Radiology.
FRIDAY.—2.30 P.M., Dr. C. E. Sundell: Diseases of Children.
SATURDAY.—3 P.M., Mr. H. W. Carson: Selected Surgical Cases.
Daily:—2.30 P.M., Operations, Medical and Surgical Clinics, &c.

MALE LOCK HOSPITAL, Dean-street, W.
MONDAY, July 12th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

CANCER HOSPITAL, Fulham-road, S.W.
Clinical Lectures on the Diagnosis and Treatment of Cancer.
TUESDAY, July 13th.—4.30 P.M., Mr. C. Ryall: Cancer of the Tongue.
FRIDAY.—4.30 P.M., Mr. C. Joll: Cancer of the Thyroid.

CHADWICK PUBLIC LECTURE, in the Large Hall of the Surveyors' Institution, 12, Great George-street, Westminster, S.W.
THURSDAY, July 15th.—5.15 P.M., Dr. N. White, C.I.E.: Health Conditions in Eastern Europe—Typhus a Serious Menace.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street (behind Whitworth Park).
THURSDAY, July 15th.—4.30 P.M., Dr. A. C. Magian: Chronic Uterine Complaints.

A CORNISH CENTENARIAN.—Mr. E. T. Pearse, of Exevill Farm, near Callington, attained the age of 105 years on May 24th.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BURNELL, A., has been appointed Medical Officer for the St. Clement and St. Mary District (Cornwall).

HOLMES, A. H., M.D., Honorary Physician to Ancoats Hospital, Manchester.

MOODY, L. M., M.D. Lond., Bacteriologist and Pathologist to the Medical Department of the Government of Jamaica.

SCALES, F. S., M.D. Camb., University Lecturer in Medical Radiology and Electrology, Cambridge.

King's College Hospital: BICKERTON, J. M., M.R.C.S., L.R.C.P. Lond., Senior Casualty Officer; JOHNS, L. P., M.R.C.S., L.R.C.P. Lond., Second Casualty Officer; PLAYFAIR, K., M.R.C.S., L.R.C.P. Lond., Junior Casualty Officer; RICHARDS, H. A., M.R.C.S., L.R.C.P. Lond., House Anæsthetist; DAVIDSON, A. N. M., M.R.C.S., L.R.C.P. Lond., YOLLAND, R. H., MATTHEWS, W. F., House Physicians; BANES, C. D., M.B., B.S. Lond., ROBERTS, O. W., M.R.C.S., L.R.C.P. Lond., REBURN, H. E., M.B., B.S. Lond., FOULKES, R. K., M.R.C.S., L.R.C.P. Lond., LAWRENCE, R. D., M.B., B.Ch. Aberd., House Surgeons; BANES, C. D., M.B., B.S. Lond., House Surgeon to Eye Department; LUCAS, H. A., M.R.C.S., L.R.C.P. Lond., House Surgeon to Nose, Throat, and Ear Department; ROBERTS, O. W., M.R.C.S., L.R.C.P. Lond., House Surgeon to Urological Department; WOOD, W. S., House Surgeon to Orthopædic Department; SURRAGE, H. J. R., M.R.C.S., L.R.C.P. Lond., Obstetric House Surgeon; CREED, E., M.B., B.Ch. Oxon., Bacteriologist.

Certifying Surgeons under the Factory and Workshop Acts: ATKINS, G. E., M.R.C.S., L.R.C.P. Lond. (Wombwell); FLOOD, C., L.R.C.S. Irel., L.A.H. (Gravesend); USSHER, N. R., L.R.C.P. & S. Irel. (Garstang).

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne Union.—Asst. Med. Supt. and Asst. M.O. £300.
Bath, Royal United Hospital. Res. M.O. £150.
Birmingham General Hospital.—Res. M.O. £155.
Bloomsbury Dispensary, 12, Bloomsbury-street, W.C.—Res. M.O. £250.
Bradford City.—Female Asst. M.O. £450 plus £67 12*s.*
Bradford Royal Infirmary.—Res. Surg. O. £250. Hon. Dent. S.
Bristol, Cossham Memorial Hospital, Kingswood.—Res. M.O. £200.
Bristol General Hospital.—Cas. H.S. £175.
Bristol Royal Infirmary.—Throat H.S., and Cas. O.
Canterbury, Kent and Canterbury Hospital.—Hon. Dent. S.
Cardiff, King Edward VII. Hospital.—H.S. £200.
Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S. £250.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—Res. M.O. £250.
Colchester, Royal Eastern Counties Institution for Idiots, Imbeciles, and the Feeble-minded.—M.O. £400.
Colchester, Severalls Mental Hospital.—L.T. Asst. M.O. 7 guineas per week.
Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £200.
Dreadnought Hospital, Greenwich.—H.S. £100.
Durham County Hospital.—H.S. £200.
Edinburgh, Royal College of Physicians Research Laboratory.—Supt. £1000. Also Asst. to Supt. £500.
Elizabeth Garrett Anderson Hospital, Euston-road.—Female Clin. Assts. in the Venereal Diseases Dept. £1 1*s.* per session. Also Anæsthetist. £10 10*s.*
Galway, University College.—Prof. of Anat. £658.
Glamorgan County Council.—Female Med. Inspector. £600.
Gloucester County Asylum.—Jun. A.M.O. £300.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. £175.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Cas. S.O. £150.
Hospital for Consumption and Diseases of the Chest, Brompton.—Asst. P.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50.
Huddersfield County Borough Education Authority.—Dent. S. £450.
Huddersfield Royal Infirmary.—Sen. H.S. £250.
Hull Royal Infirmary.—Asst. H.S. £150
Kettering and District General Hospital.—Res. M.O. £300.
London Temperance Hospital, Hampstead-road, N.W.—Asst. Res. M.O. £120.
Maidstone, Kent County Council.—Tuberc. O. £670.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Maidstone, West Kent General Hospital.—H.S. £250
Manchester, Ancoats Hospital.—Res. M.O. £150. Two Jun. H.S.'s. £100. Hon. Dent. S.
Manchester Victoria Memorial Jewish Hospital.—Res. M.O. £150.
Middlesex Hospital, W.—Surgical Registrar.
Middlesex Hospital Medical School.—Chair of Radiology. £1000.
Norwich, Administrative County of Norfolk.—Tuberc. O. £600.
Plymouth, South Devon and East Cornwall Hospital.—H.P. £140.
Prince of Wales's General Hospital, Tottenham, N.—Jun. H.P. £120. Also Hon. Asst. S.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—District Res. M.O. £80.
Roll of Honour Hospital for Children, 688, Harrow-road, W.—Female Hon. Asst. P. and Temp. Asst. P.
Rotherham Hospital.—Jun. H.S. £150.
Royal College of Surgeons of England.—Examiner in Dent. S.
Royal Ear Hospital, Dean-street, Soho, W.—H.S.
Royal Institute of Public Health.—Sen. Demonstrator of Bacteriology.
Ryde, Royal Isle of Wight County Hospital.—Res. M.O. £250.
St. Albans, Herts County Mental Hospital, Hill End.—Locum Tenens M.O. Eight guineas a week.
St. Helens Education Committee.—Dentist. £500.
St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum, City-road, E.C.—H.S. £150.
Seamen's Hospital, Albert Dock, Connaught-road, E.—H.S. £100.
Sheffield Royal Hospital.—Asst. Cas. O. £150.
Sheffield Royal Infirmary.—H.P. £150.
Sheffield University.—Demonstrator in Anat. £350.
Sunderland Royal Infirmary.—Jun. H.S. £200.
Stafford, Staffordshire General Infirmary.—H.S. £250. H.P. £200.
Staffs Education Committee.—Practitioners under M.O.H. and Sch. M.O. £600.
Swansea General and Eye Hospital.—Jun. H.S. £200.
Townsville, Queensland, Australia.—Director, Institute of Tropical Medicine. £1200.
University College Hospital, Gower-street, W.C.—Hon. Asst. in Ear, Nose, and Throat Department.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. £100.
Wakefield, West Riding Asylum.—Jun. Asst. M.O. £400.
Walsall General Hospital.—Hon. Asst. S.
Warrington Infirmary and Dispensary.—Jun. H.S. £200.
West London Hospital, Hammersmith, W.—H.S. and H.P. £50. Also Asst. S.
Westminster Hospital School of Medicine, Broad Sanctuary, S.W.—Obstetric Tutor.
Worcestershire County Council.—Asst. County M.O.'s and Sch. Oculist. £500 each.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

The Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Shefford and at Sleaford.

Births, Marriages, and Deaths.

BIRTHS.

HARDY.—On June 29th, at Leigham-court-road, Streatham, the wife of G. Frank Hardy, M.C. (Captain, R.A.M.C.), of Highlands, Champion-hill, S.E., of a daughter.

ROY.—On June 28th, at Lower Belgrave-street, the wife of D. W. Roy, M.B., F.R.C.S., Upper Brook-street, of a son.

MARRIAGES.

CURRIE—HARVEY.—On June 30th, at All Souls, Langham-place, London, Walter Thompson Currie, M.B., Ch.B., to Annie Wallace, eldest daughter of the late Andrew Harvey, of Greenlaw, Woldingham, Surrey, and South India.

GIBSON—CHAPMAN.—On June 29th, at St. John's Church, Putney, Captain Colin Gibson, R.A.M.C., to Lorna Rougier, fourth daughter of G. H. Chapman, Woodboro' Lodge, Putney.

SINCLAIR—BERRIDGE.—On June 24th, at Holy Trinity Church, Brompton, Andrew Fulton Sinclair, F.R.C.S., to Janet Mary, daughter of Mr and Mrs. Charles Berridge, formerly of Ripley, Surrey.

VICK—NEVILLE.—On June 30th, at the Church of St. Martin-in-the Fields, R. M. Vick, O.B.E., F.R.C.S., of the Warden's House, St. Bartholomew's Hospital, to Jane, eldest daughter of M. K. Neville, Esq., 25, Eccleston-square, S.W.

DEATHS.

BLAKE.—On July 3rd, suddenly, at Regent-road, Great Yarmouth, Henry Blake, M.B., B.S. Lond., aged 68 years.

HANDFIELD-JONES.—On July 2nd, Charles Montagu Handfield-Jones, M.D., F.R.C.P., aged 65 years.

SUTHERLAND.—On June 27th, at the Prince of Wales Hospital, Calcutta, of peritonitis after operation, Colonel W. Dunbar Sutherland, Imperial Serologist, M.D., C.I.E., I.M.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NEW HOSPITAL FOR THE TREATMENT OF SURGICAL TUBERCULOSIS.—The Exeter Town Council is joining with Somerset, Devon, and other authorities in erecting a joint hospital for the treatment of surgical tuberculosis. The cost to Exeter is estimated at about £2500 for 10 beds, with £1 5*s.* for maintenance of each bed.

DONATIONS AND BEQUESTS.—Among bequests left by the late Mr. Thomas Jeremiah Williams, of Morriston, Swansea, is one of £1000 to the Swansea General Hospital.—By will the late Mr. John Thomas Gipson Clarke, of Leicester, left £1000 to the Royal Infirmary, Leicester; £500 each to the Leicester and County Saturday Hospital Society and the Leicester Guild of the Crippled; £200 each to the Leicester Blind Institute, the Leicester Wycliffe Society for Helping the Blind, the Leicester Surgical Aid Society, and the Institution for Diseases of the Skin.—The late Mr. Edward King Mason, of George-road, Edgbaston, Birmingham, has left by will £500 to the Queen's Hospital, Birmingham; £200 to the Orthopædic Hospital, Birmingham; £200 to Middlemore's Homes; £200 to the Birmingham and District Crippled Children's Union; £200 to the Society for the Prevention of Cruelty to Children, Birmingham.—The Chelsea Hospital for Women has received from an anonymous friend a donation of £200 for its convalescent home at St. Leonards-on-Sea.

Notes, Short Comments, and Answers to Correspondents.

AN INQUIRY INTO THE MENTALITY OF JUVENILE ADULT DELINQUENTS.[1]

BY JOHN M. AHERN, M.B., B.CH. N.U.I.,
MEDICAL OFFICER, H.M. BORSTAL INSTITUTION, BORSTAL.

THE results of an inquiry extending over rather more than 12 months into the mentality of the inmates of H.M. Borstal Institution, Borstal, should be of some interest in regard to the important question of the relationship between "juvenile adult" crime and mental defect. A sentence to a Borstal institution is given to young criminals who are passing through the plastic adolescent period of life—that is, from 16 to 21 years of age. In a few exceptional cases the maximum limit is extended to 23. The name of "juvenile adult" is given to this class of offender. The sentence is either for two or three years, but as a rule for the longer period, in accordance with the recommendation of the Prison Commissioners. The actual period of detention beyond a certain minimum is almost wholly dependent on the conduct of the inmate and the progress he has made in his training, but the longer sentence allows more time for the guidance and observation of his conduct on the conditional discharge, which he earns, and for his return to the institution should this prove unsatisfactory. The after-care is carried out by the Borstal Association, and their function may well be compared to that of a crutch after the removal of splints. To be deprived of its assistance too soon may mean a return of the old condition and the loss of an irreparable chance of its remedy.

The Two-fold Object of Treatment.

The object of the Borstal sentence is twofold—penal and reformatory. Each inmate has to pass through successive stages, in the first of which the penal element predominates, to be gradually replaced by reforming influences until in the final stages it practically ceases to exist and is succeeded by as large a measure of personal freedom and privileges as is compatible with a well-regulated institutional life. The freedom from close supervision, and the sense of trust by which it is replaced, together with the more intimate association with others, is a near approach to the conditions and temptations of the world outside. A most suitable atmosphere is formed for the observation of mentality, and the behaviour of an inmate under these conditions is of itself a mental test of the highest value and significance. One of the beneficent results of the Borstal system is that it affords an opportunity for mental grading which should be of great value in future years when dealing with cases that show an early history of crime. Most of them will have passed through a Borstal institution at the most likely age for tests and observations to show any existing defect, and thus the consideration of the mentality of the offender can take its place in the scales of justice to a much greater extent than is possible to-day.

The depth of the delinquency of the inmates—the extent to which their minds have been formed by criminal habits—has a bearing upon the subject. Almost all have had one or more previous convictions, and have failed to be weaned from their criminal ways by the supervision of the court probation officer. In a few cases a single offence only has been committed, but of an exceptionally serious nature, or under a bad home environment from which removal is an essential preliminary to reformation. Over 90 per cent. of the inmates have been guilty of repeated thefts or allied offences, and practically all have strong and obdurate criminal tendencies which, if fostered by short and repeated terms of imprisonment, would most assuredly lead to their ruin.

Factors Invalidating the Inquiry.

There is one qualification that a juvenile adult offender must have before his admission to a Borstal institution—he must be free from such mental or physical defect as would prevent him from responding to influence and training. On the physical side this does not mean that he must be free from all defect, provided that it is not of such a degree as to prevent his being taught a trade of a sedentary character, such as tailoring or boot-repairing. Similarly, a slight degree of mental dullness is not a bar to admission. The low-grade defective should never come to a Borstal institution, though unfortunately—owing, no doubt, to war conditions—some have crept in who should really have been certified under the Mental Deficiency Act. Thus the proportion of mental defectives found in the institution is not a true estimate of the part played by the defectives in "juvenile adult" crime. How far it underestimates this proportion I have no data to determine. A second factor that might invalidate the results of the inquiry is that it does not include all those sentenced to detention in a Borstal institution within a given time. There was not, however, so far as I know, any special selection of those who were sent, so that they may be taken as a fair sample for statistical purposes. Finally, it must be borne in mind that there would naturally tend to be a concentration of mental defectives, as they would be slow in qualifying for discharge. As a matter of fact, I find that about one-third of those certified defective within the period under review were detained considerably beyond the average time for discharge.

Details of the Investigation.

The inquiry extends from Feb. 1st, 1919, to March 31st, 1920. On the first of these dates there were 434 inmates in the institution, and during the succeeding 14 months 494 additional inmates were received, making a total of 928. This number was too large, and the time at my disposal too limited to admit of systematic grading. Of those already in the institution the most obvious and insistent cases had to be dealt with first, whilst fresh arrivals were put through an examination less exhaustive but sufficient to detect mental defect or to question its existence. These were noted for subsequent detailed examination and inquiry. The work is tedious, fatiguing, and cannot be hurried.

The scheme of examination followed was drawn up rather with the intention of ascertaining the nature of the defect than of attempting to assess the mental age at which development had arrived. The mental tests were selected from various authorities on the subject, and call for no explanation or special recognition.

The investigation was carried out under the following heads:—

A.—Range of information apart from that acquired by rote or school work.

B.—School standard in reading, writing, and arithmetic, with progress being made.

C.—Questions on incidents of past life with a view to testing recent and distant memory.

D.—The following mental tests: 1. Enumeration of 12 objects observed for one minute. 2. Repetition of figures. 3. Repetition of sentences. 4. Taking key off split-ring. 5. Interchange of clock hands. 6. Cancellation of a letter in a printed passage. 7. Copy of two simple diagrams from memory. 8. Giving words of opposite meaning. 9. Successive deductions of 4 from 100 and 7 from 100.

E.—Particulars of past offences.

F.—School and home history.

G.—Employments before admission with wages earned.

H.—Progress in the institution with opinion of his instructors.

I.—Conduct in the institution with any evidence of emotional weakness.

J.—Employment of spare time and use made of library, with inmate's description of books read.

K.—Family history in relation to insanity, "fits," crime, and drink.

There was no pedantic importance attached to the failure to comply with one or more tests. Each case was viewed from the broad standpoint of whether there was a fitness for the competition of life, even in its humblest capacity, or whether it were not kinder to put into operation the powers of a protecting State than send adrift to prey upon society, the helpless victim of his own imperfect organisation.

Results.

Working on this basis 37 inmates were certified under the Mental Deficiency Act. Eleven more were considered to be within the Act, although not actually certified either on account of their transfer to another establishment or their discharge before action was taken. Of 30 inmates who were removed on account of continued misconduct, probably 20 came within the terms of the Act, although the detailed examination and inquiry had not been made. There remain in the institution close on 20 who are, in my opinion, certifiable. To these figures should be added 4 who were certified insane, and may be presumed to have had a pre-existing mental defect. This makes a total of 92 defectives in a population of 928—or approximately 10 per cent. This figure I hold to be a very conservative estimate. It takes no account of the border-line cases and of the large number who show varying degrees of mental defect. The line which marks off those who are certifiable under the Mental Deficiency Act is of necessity vague and uncertain and largely dependent upon the views of the examiner. Individual opinion will, however, be kept in constant check by the knowledge that it will have to be endorsed by subsequent examiners.

The mental defect observed may be considered under three forms according to the predominating features of their blend: (1) defect of intellect; (2) defect of emotional functions (lack of control, mental conflicts, &c.); (3) moral imbecility.

Defect of Intellect.

Defect of intellect much below the average is not difficult to discover or demonstrate. The stage of development which they have reached can be more of less approximately

[1] Published by permission of H.M. Prison Commissioners.

gauged by the Binet-Simon method or some modification of it, and expressed in terms of mental age. This measurement was not undertaken, but I can say that no case was certified on the ground of defect of intellect alone who approximated to a development of 12 years. In the bulk of cases certified defect of intellect was so obvious a feature that I class them under this head, but there were few, if any, who did not show some signs of emotional defect as well.

There seems to be a widespread though erroneous view that the mental defect and defect of intellect are synonymous terms. This is not so. Mentality implies something more than intelligence, and so, too, does the defect thereof; in fact, I question whether criminal propensities exist as a result of mere defect of intelligence. How often is the village fool of an amenable and inoffensive disposition, and trusted to play a small though useful part in the life of its community. Unfortunately, there is no measurement for emotional defect as there is for that of intelligence.

Emotional Defect.

Emotional defect of pronounced form most often shows itself in misconduct; this does not, of course, imply that all misconduct is to be attributed to this cause. The misconduct of the mentally defective has as a rule certain well-marked characters which make it easy to distinguish. In the first place, it is purposeless. In this connexion I would again refer to the strong inducements which exist for good conduct in a Borstal institution. Not alone are there privileges to be earned, but there is, above all, a possible discharge after one quarter of the period for which the sentence was given has elapsed. The minimum period of detention has recently been extended, but its contrast to the full sentence must still be a potent influence to the mind of the average lad. Continued misconduct of a purposeless character that sets at naught individual interest is always suggestive of mental defect either on the side of intellect or emotional control. The offender is at least a dullard in the school of experience with an unnatural disregard for his own happiness or an inability to appreciate or be guided by the obvious consequences of his acts. Especially is it suggestive when the misconduct takes the form of destructiveness. An inmate who picks up and smokes a "fag," who steals an egg from the institution farm, or who absconds, takes a reasonable gamble for gain or gratification, although it is interesting to observe that those who have tried to abscond were mostly mentally defective, as experience showed the prospects of ultimate escape to be practically nil. The inmate guilty of this class of rational misconduct is from a mental point of view in an altogether different category from that of one who aimlessly smashes up the institution property or has at most some half-formed illogical idea of "getting his own back."

Emotional defect is not inconsistent with good intelligence, but in the young offender it is most often accompanied by a deficiency in this respect, though not always of a marked degree. It may be described as a riot of emotions in which volition has become usurped. When the fury has spent itself volition regains its weak dominion, but with no greater power of control or of preventing a recurrence of the disorder on the slightest irritation. It manifests itself in a fitful series of explosive acts, most frequently destructive or violent. A mood of repentance follows, with promises of amendment, and later on the paroxysms recur with renewed violence. Asked why they behave in this way, these lads will often say that they cannot help it, or that it gives them relief. Psychic epilepsy is an expressive term for such a condition. The nature or degree of misconduct bears no relation to its cause; it may originate in some trivial or fancied grievance, and not infrequently it is imitative.

Lastly, physical signs of the emotional disturbance may often be noted, such as quivering of the lips, twitching of the facial muscles, or other evidence of motor restlessness or incoördination. Headache and head sensations are frequently complained of. It may be urged that much of the emotional weakness described might be due to an adolescent instability that will pass off when maturity is reached. Their past and family history and the depth of the defect will probably in most cases serve to eliminate those who are only temporarily affected, but even in these cases it is most important not alone to the State but to the individual himself that he should be kept under a controlling supervision so long as the defect continues, as criminal habits formed in this phase are likely to remain when the phase passes off. For this reason a longer period of detention than can be secured by a sentence to a Borstal institution is advisable in some cases.

I have already pointed out that unless cases of emotional defect show also a considerable lack of intelligence their certification is often a matter of the greatest difficulty. Their good behaviour under rigid supervision is no proof that their misconduct is merely badness which they are well able to control. The question is not how the subject of emotional weakness is going to act under purely artificial conditions, but how he is going to act in ordinary life. A soldier urged forward by a revolver to meet the enemy is not accounted a brave man, nor can it be said that his power of self-control is sufficient of itself to overcome his sense of fear or his impulse to run away, and the conditions are not incomparable. However well-behaved and hard-working under close supervision, the subjects of emotional defect are incapable of continued effort or undivided attention when left to themselves. They are excitable, easily distracted, and readily influenced; they are thoughtless, idle, and mischievous, and, in fact, one may say that on the emotional or affective side of the mind they have not developed beyond childhood. Mental tests show that though deficient in attention and judgment they are not much lacking in general intelligence. Their range of general information is good and their standard of education is up to the average of this class. These boys will neither be kept, nor want to remain, long in any employment, and, when out of work, will take the line of least resistance and drift into crime, possibly as the tools of stronger minds. It is exceedingly difficult to know what to do with them. Many will doubtless improve as they grow older, but in others the defect which was the chief factor of the criminality already shown will continue to influence them for some years after their discharge. Unfitted for the competition of life, many of them will, I am afraid, become habitual criminals.

The Moral Imbecile.

The last class of case to which I would refer is the moral imbecile. Of the 37 inmates certified, 5 came under this heading. The whole question of moral imbecility is one beset with difficulties. Some authorities deny the existence of such a class as distinct from the other forms of defect, whilst its limits are various and uncertain. A high authority defines a moral imbecile as one who "has no conception of any social or moral obligation, and is lacking in the higher faculty of control and wisdom," but in my view such a definition does not cover the cases of moral imbecility met with among the criminal classes. Something more is required than a mere passive negation of the moral sense unless it connotes, however illogically, an antisocial perversion of it. Hostile to every regulation and social restraint, certain boys delight in misconduct for misconduct's sake. They treat kindness as a weakness and punishment only stimulates their bad behaviour. The so-called prison lawyer is often a type of this class. They satisfy one condition of the definition of moral imbecile contained in the Mental Deficiency Act—i.e., they show an incorrigible moral perversity; but unless there is other evidence of mental defect this is, from the point of view of responsibility, treated in law the same as any other perversity. In many of these cases evidence of some permanent defect that has existed from an early age may be obtained, and then they can be dealt with under the Mental Deficiency Act as "moral imbeciles." In these cases it is evidently the intention of the Act (and very rightly, in my opinion) that a lesser degree of defect should suffice for their certification than if no strong vicious or criminal propensities existed. With regard to the condition laid down, that punishment must have little or no deterrent effect, this would seem to be satisfied by a continuous history of misconduct from childhood, continuing under reforming influences such as those of a Borstal institution.

The marked correlations between mental and physical development is well exemplified by those who were certified to be mentally defective. Although the average height of the Borstal inmate is over a couple of inches below that of the general population of the same age, the average of the defectives was as much again short of this low standard on their removal from the institution, notwithstanding its excellent dietary and healthy surroundings.

The percentage of Borstal inmates who get re-convicted after their discharge is about 30. This percentage of failures is not too high to be largely accounted for by border-line cases and those who are too severely handicapped by physical defects. I believe that a study of the mentality of these cases will justify the opinion that, given a lad whose mental development is within reasonable limits of the average and whose criminal habits are in the main the result of environment, bad companions, or incompetent parental training, the Borstal system seldom fails to turn him into a law-abiding, wage-earning citizen.

PUBLIC HEALTH IN SIERRA LEONE, 1918.

THE population of the Colony at the last census was 75,572 (41,001 males and 34,571 females). The birth-rate in 1918 was 19 per 1000 and the death-rate 45 per 1000. In Freetown the birth-rate was 20 and the death-rate 62 per 1000. The number of European and American residents in the Colony in 1918 was 1036 (officials 185, non-officials 277, military 574).

The average number of resident European officials was 97. Among these, 158 cases were placed on the sick list for a total period of 1528 days. The average number of days upon the sick list for each patient was 9·67, and the daily average on the sick list 4·18. There were 6 deaths during the year, and 11 officials were invalided, the percentage of invalidings to the total number of residents being 4·84. Registration of births and deaths is compulsory in the Colony,

but not in the Protectorate. The excess of deaths over births registered in the Colony shows an increase this year of over 100 per cent. This excess, however, is due principally to an epidemic of influenza which visited the Colony in the latter part of 1918, and to which 1072 deaths were attributed. The annually recurring excess of deaths over births suggests that the population of the Colony is steadily decreasing, but as there is a constant influx of Protectorate natives into the Peninsula, and as the strict enforcement of the Registration Ordinance presents some difficulty the figures given must be accepted with caution.

The population of the Protectorate in 1911 was estimated at 1,327,560, of whom 3426 were non-natives. This estimate was based on the number of houses on which tax had been paid and on the assumption that so many persons live in one house, the number varying from 5 to 10 per house according to the custom of the tribe. During 1918 both the Colony and Protectorate were visited by a severe epidemic of influenza. It is estimated that two-thirds of the population contracted the disease and that during the month of September 3 per cent. of the native population died from this cause. The number of admissions to the hospital and the total attendance at the different dispensaries of people suffering from malaria showed a considerable decrease. Smallpox in a mild form occurred in various parts of the Colony and Protectorate, but partly owing to the new scheme of locally appointed vaccinators there was a large diminution in the total number of cases. Out of a total of 63,700 vaccinations reported as performed 32,033 were returned as successful.

Anti-malarial Measures.

Anti-mosquito measures on a much more extensive scale than hitherto have been carried out in Freetown. As there was reason to believe that malaria was being introduced into England by crews of ships infected at Sierra Leone, it was considered necessary to adopt more effective anti-malarial measures at the port, and a sum of £20,000 was accordingly set aside for this purpose. Mosquito-breeding plants and trees with natural or artificial cavities were systematically dealt with, and during the year 145 wells were closed. Only one case of yellow fever occurred during the year in Freetown, and, so far as is known, no cases occurred in the Protectorate. No case of plague occurred and no evidence of plague was discovered by the bacteriological examination of the 5987 rats caught during the year. The mean maximum temperature at Tower Hill Observatory was 94·00° F., while the mean minimum temperature was 62·00° F. The rainfall was 103·43 inches. To the European Nursing Home there were 288 admissions during 1918, 150 more than in 1917. The number of war vessels in the harbour and the influenza epidemic were responsible for the increased admissions. There were 25 deaths, which mostly took place a few hours after admission, from influenza and pneumonia.

The number of patients treated at the various hospitals and dispensaries throughout the Colony and Protectorate in 1918 totalled 55,562. At the Leper Asylum there were 3 patients at the beginning of the year. During the year 4 were admitted; 1 died, 1 absconded, and 2 were discharged, leaving 3 in the asylum at the end of the year.

THE FINAL CLOSURE OF THE BRIGHTON PAVILION HOSPITAL.

AN event received with great satisfaction by the inhabitants and visitors on June 25th was the reopening of the roadway through the Royal Pavilion grounds at Brighton. Since its occupation by the military authorities in the autumn of 1914, this roadway has been barred to the public. The fact that the Pavilion Hospital was evacuated of the last patients nearly eight weeks ago, and that the gates were still closed, was the basis of a recent question in the House of Commons, which elicited the news that the hospital would be entirely closed, and the premises handed over to the Corporation by July 14th. There has been yet another cause for agitation among the townspeople. In the latter period of the war, after the withdrawal of the wounded Indian troops, who were first located at the Pavilion Hospital, the hospital was devoted wholly to soldiers who had lost a limb, and this led to the establishment in the Pavilion grounds of some of Queen Mary's workshops. It is the future of these buildings that has provoked so much controversy. In spite of a strong feeling among the public in favour of the retention of the huts in the Pavilion grounds, the Brighton Corporation has decided that they must be removed. It is generally considered that the Pavilion site is an admirable one for the workshops, which at a trifling outlay could easily be made entirely independent of the Royal Pavilion estate. Moreover, the appeal from the Ministries of Labour and Pensions was that the workshops might be allowed to remain, not for all time, but for two years only. Those members of the Corporation who voted for their removal to a hilly neighbourhood amid a dense population seem to have quickly forgotten that these workshops were intended to benefit the men maimed in the war, from the horrors of which Brighton was to a large extent immune.

COTTAGE BATHS.

AT Bradford, the *Local Government Chronicle* informs us, 2,898,905 baths had been taken in 1919 in "cottage baths," institutions originated by the local baths committee in 1906. The first cottage bath establishment was opened in what had been a stable, and 10 more have since been added. It is considered that a number of unpretentious bathing establishments placed near the homes of the persons for whom they are intended, encourage women to go who might not care to go far and might be shy of entering more pretentious buildings with others of a different class from themselves. Overcrowding also is avoided to some extent. Most of the cottage baths at Bradford are set aside for children on four days of the week, and provision is made for taking children to them direct from school. They are supplied with soap and clean towels, the washing of those who are too young to look after themselves is supervised; verminous clothing is cleansed and dried. During the 12 months preceding March 31st, 1919, 73,258 slipper and shower baths were given to children free of charge. The idea appears to be a sound one and to have been carried out on practical lines. The bringing of cleanliness within easy reach of all who may desire it in the way indicated should be possible, whereas any general extension of bathrooms in houses for the working classes would almost inevitably tax the water-supply of most towns beyond reason. Waste of water would make up in some cases for neglect to use the baths in others, and a bathroom not used as such makes an expensive bedroom or lumber-room.

THE CHILDREN'S COUNTRY HOLIDAYS FUND.

WHILE the rise in prices has rendered the work of the Children's Country Holidays Fund more difficult, the cost of living, with its housing and food disabilities, has made the need for giving an annual holiday to the children of our slums all the more pressing. We therefore heartily endorse the appeal of the Earl of Arran, honorary treasurer of the Fund, for financial help in the sending of poor children to the seaside or the country for a fortnight's holiday. The cost for board last year was 9*s*. per week per child; it is now 12*s*. Subscriptions should be sent to Lord Arran at 18, Buckingham-street, London, W.C. 2, or to the bankers, Messrs. Barclay and Co., Ltd., 1, Pall Mall East.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, J. B., ET FILS, Paris.
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Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

The State
AND THE
FUTURE OF MEDICAL PRACTICE.

An Address introductory to the Discussion on the Future of Medical Practice at the Eighty-eighth Annual Meeting of the British Medical Association.

BY SIR GEORGE NEWMAN, K.C.B., M.D. EDIN., F.R.C.P. LOND.

THE CLAIMS OF THE STATE ON THE DOCTOR.

MR. PRESIDENT AND GENTLEMEN,—From the earliest times the doctor has served the State, but in this country the direct official inter-relationship is not yet a century old. In 1830 the only direct medical interest of the State, as represented in the Government of the day, was quarantine and vaccination. But in 1831 the Government became anxious about the spread of cholera, then moving towards us from Russia, and an Advisory Board of Health was formed, cholera dispensaries established, and inquiries instituted. One of the results was a measure of defence against cholera, but, far more important, interest was awakened in the insanitary conditions amid which the mass of the people lived—an interest which was confirmed by the inquiries of the Poor-law Commissioners appointed under the Poor-law Amendment Act of 1834. No statute before that of 1834 had definitely provided for the State medical treatment of the pauper, though from 1536 the sick poor had been differentiated from the able-bodied. The famous Poor-law of Queen Elizabeth in 1601 had required the "necessary relief" of the disabled pauper, and under that enactment a wide and rather indiscriminate practice of medical treatment had in fact arisen. Thus it came about that between 1834 and 1838 the Poor-law medical service emerged as the forerunner of the public health service; in 1839 Farr began his work on medical statistics; in 1847 the first medical officer of heath was appointed; and in 1855 a central medical department was established in Whitehall—first, under the Board of Health (1855–58), then under the Privy Council (1858–71), then under the Local Government Board (1871–1919), and, lastly, under the Ministry of Health (1919). These four historical steps in development from the Poor-law origin laid the foundation of the present position of State medicine for the civil community—the Poor-law medical service under 636 Poor-law unions and upwards of 4000 medical men, the public health service under 1800 sanitary authorities and 318 local education authorities, with a composite staff of another 3000 medical officers, the Registrar-General's Department, and the Ministry of Health.

Alongside this entrance of medical men into direct State service there was constantly proceeding a further imposition of statutory duties upon the medical practitioner. Apart from the fact that he may be called upon to undertake official duties in the public service he is liable *under statute* in the following respects:—

1. He must certify births and deaths (Births and Deaths Registration Act, 1874), and notify all births within 36 hours (Notification of Births Acts, 1907–15); he must notify cases of infectious disease (Infectious Diseases Notification Acts, 1889 and 1899, and special notification regulations as issued), of industrial poisoning (Factory and Workshop Act, 1901), and of verminous children (Children Act, 1908). He must also be ready to vaccinate (Vaccination Acts, 1871–1907) and to certify the removal of infectious cases to hospital (Public Health Act, 1875).
2. He may be called upon to inspect and certify for house disinfection (Public Health Act, 1875, and Infectious Disease Prevention Act, 1890), and be prepared to issue certificates for the removal and burial of dead bodies (Ibid).
3. He may be required to inspect and condemn in regard to nuisances and insanitary house property (Public Health Act, 1875, or Amendment Act, 1907), or inquire into unhealthy or insanitary areas (Housing of the Working Classes Act, 1890).
4. He must know something of the ill-effect upon health of dangerous or offensive trades (Public Health Act, 1875), and of unsound food (Public Health (Unsound Food) Regulations, 1908).
5. He must be competent to diagnose all forms of mental disease (Mental Deficiency Act, 1913).
6. He must be available to respond to the requirements of the local sanitary authority for the provision of medical assistance and treatment for the poorer inhabitants of the district in which he lives (Public Health Act, 1875, s. 133).
7. He is liable for a series of duties in regard to workmen's compensation (Workmen's Compensation Act, 1906, s. 8), superannuation, and pension claims (Ministry of Pensions Act).
8. He may be called in by a midwife to assist in cases of emergency (Midwives Act, 1918, s. 25).
9. The local education authority may avail themselves of his services in connexion with the treatment of children and young persons (Education Act, 1918, s. 25).

Lastly, the State has in recent years organised in behalf of the community certain branches of ordinary and special clinical work. The National Insurance Act of 1911 brought 12,000,000 insured persons into medical benefit, at present provided by 12,000 doctors and 10,000 chemists; systematic provision has been initiated for tuberculosis, venereal disease, and maternity and infant welfare; the organised treatment of early mental disease, ophthalmology and tropical disease, and the large questions of orthopædics and the treatment of industrial diseases are now under discussion; and an ever-widening field of public dispensaries, clinics, and hospitals has opened before the profession.

CONSEQUENT NEW RELATION BETWEEN STATE AND DOCTOR.

These are profound changes. They divert, in a handful of years, the whole course of applied medicine from its century-old pathway. They do not abolish the private medical practitioner, but they bring him into a different relation to the State. Their present and future relation must be confirmed and made good on both sides, for, on the one hand, the profession is conscious of new obligations, both those imposed by law and those imposed by a sense of what is demanded by the civilisation in which they live; and, on the other, the State is conscious, as never before, of the community's need of the profession, and the value of the profession's help if sought on the right terms and given in the right spirit. The greatest need on both sides is understanding. Value is the result of the application of mind to matter. The new problem is for State and profession to come to a realisation of the principles which should govern their inter-relation. It is an association peculiarly difficult. For historical reasons the State (which means for the present purpose all authorities, local as well as central, concerned with health) has seen prima facie in the profession a body insistent upon the privacy and individuality of its work, the sanctity of its traditions, the freedom of its engagements. Correlatively the profession has seen in the State an organisation apparently devoted to the infringement of these traditions and incapable of putting anything worthy in their place. It has been suspicious and mistrustful of what it considers to be unnecessary intervention. It has feared the imposition of some cast-iron system, some form of so-called "nationalisation," the institution of a whole-time civil service, which might in practice make the practitioner of medicine servile, dependent, and fettered.

What can improve this relation? The answer to this question seems to be—a larger measure of understanding by the doctor of the business of central and local government as representing the whole community, and by the State and its officers and representatives, high and low, of the history, development, and genius of professional character. The doctor should know something of the respective functions of Parliament, of the Cabinet, of the Treasury, of the dozen departments dealing with health problems as subordinate to their main functions, of the Ministry of Health (medical and lay), and its Medical Consultative Council. Further, he should know the meaning of the English system of local government; how it has evolved; why the country is subdivided into shires, boroughs, urban and rural districts and parishes, and what the main purposes are of the respective bodies providing for health, pensions, Poor-law, education, and insurance. For it is only by

such knowledge, inspired by the historical spirit, that the doctor can obtain a grasp of the machinery by which and through which he can render his communal service to the State. He will discover, incidentally, the working of some of the great principles of representative government and the guarantees of its freedom.[1] The layman, what Anthony Trollope, following ancient custom, called "the clerk," besides specialised knowledge of the law and practice with which he is primarily concerned, should learn as much as he can of professional tradition and sentiment, of the scope and opportunity of voluntary work (from the great hospitals downwards) which touches the profession, of professional organisations, and of their history and relation to each other.

Such knowledge on both sides has a direct bearing on the effective working out of the extended relations between the profession and the State which it is now recognised are inevitable. It would enable doctors to understand those necessary and, at first sight, rather remarkable limitations of Government action, which at present he deems to be merely stupidity. For instance, in official work regard must be paid to uniformity, to a "national minimum," to what is practicable rather than what is desirable, to the restrictions of the law, and to public economy. The layman in his turn will learn why doctors are jealous of their *private* practice, of the system of hospital appointments, of the restrictions of whole-time work under public authorities, of the whole personal nature of their relations with their patients, and of professional honour, integrity, and etiquette. These matters are not mere expressions of idiosyncrasy, prejudice, or narrowness of mind. They have behind them a long history, sound reason, and something of a philosophy. Some of them may be vestigial remains of a dead past; others have come to us, living, virile, and purposive, across 2500 years from the days of Hippocrates.

The general effect of this suggested change of outlook would be that the doctor became more political in the true Greek sense, and not with any partisan or meretricious meaning, but rather in the sense in which man was described as a political being, conscious and considerate of the community in which he lives; and Whitehall and the local authorities would realise how far short they are of full understanding of the profession, with whom they must work, and of its growing cohesiveness, its quest of truth, and its undying spirit of "love of humanity associated with love of craft."

FIVE PROBLEMS AWAITING COÖPERATION OF STATE AND DOCTOR.

Partly by way of illustration of the application of these general principles, and partly by way of demonstration of their necessity, I propose to mention briefly five outstanding problems which now face the medical profession in its relation to the State. It will be understood that my purpose is to open a discussion and not close one, and that I am speaking wholly in an unofficial capacity.

1. *The Unit of Health Government.*

The present system of local health government in England is like an Egyptian palimpsest, composed in several layers of design lying one upon the other. At the bottom there are the Poor-law unions, next above them and three times more numerous are the local sanitary authorities, superimposed upon which come the local education authorities (318), then the Insurance Committees numbering 145, and at the top the latest addition, the Local War Pensions Committees. Thus the whole country is mapped out five times over, but the charting has been done by different hands, at different times, and for different purposes, and hence arises duplication, overlapping, and confusion. There is confusion in areas and authorities, but there is no less confusion in the family. There are five local authorities concerned with maternity and infancy; three with children of school age; six authorities deal with persons of unsound mind or mental deficiency; four authorities are concerned with "sick persons"; three with the aged poor; and five with the able-bodied poor. It is all anomalous, extravagant, and redundant, with a result which is ineffective and wasteful. What we seem to need in the abstract is, first, *a single unit of health government* with necessary subcommittees for particular purposes. The principles which should guide us in devising such a local authority are: (*a*) the concentration, as far as practicable, in one authority in each area, of the responsibility for all administration of health services from local rates, with or without Exchequer grant in aid; (*b*) the absorption of the work of the Poor-law and insurance in a public health service and the use by that service for the whole community of Poor-law medical institutions; and (*c*) the unification in appropriate committees of the local authority of all public medical provision for the sick and infirm of all ages. Clearly, there would be advantage in thus having one authority for all health purposes—for a Poor-law medical service, sanitation, education, insurance, and pensions—and towards unification of this nature many are looking. But the question is large and complex, and there are many considerations to which regard must be paid in prescribing a unit of sanitary government, including its history, size, population, urbanisation, character of industry and society, inter-communication, rating, relation to local and central government, and so forth. If a large local unit be contemplated, it would be necessary to provide for the encouragement of a consciousness of community of interest and aim in the smaller contributory or constituent divisions, with appropriate delegation of powers or functions in accordance with services to be rendered. The large autonomous body might in that way delegate some of the actual detail work to the more local bodies. If, on the other hand, a small local unit be contemplated, many analogous questions would arise. All I desire to do here is to name the general principle of unification as one to which attention must be given. There is a second, somewhat similar, common-sense requirement—namely, *uniformity of administration*—in all comparable areas. All through the country and in all departments of State medicine there is need for introduction of accepted standards and a larger measure of equalisation and uniformity of central and local action. There remains a third principle which the profession must not allow itself to forget—namely, that the local unit of health government must be *representative* of the will of the people as a whole. It cannot be wholly medical in personnel or in purpose. It must be comprehensive and disinterested. "Our trade our politics" is never sound statecraft.

Now, in devising this reform the medical profession must, in the interest of the State not less than the profession, take their share, exchanging with the layman their views on many points—the nature of the authority, its membership, the question of the coöption of experts, finance, medical participation, the respective functioning of the different local committees, the use and adaptation of existing institutions and their economical arrangement, and the place and character of the domiciliary medical services.

2. *The Extension and Coördination of Medical Provision.*

Here again is a pressing problem calling partly for unification and simplification and partly for systematic organisation. At present there are inadequacy, unequal provision, and piecemeal effort. We shall never get an ordered scheme in that way. We need a national policy—a programme, so to speak—dealing seriatim with the medical problems of maternity, infancy, children, adolescence, adult life, and old age; with environment of home and workshop; with the prevention and cure of non-infectious diseases as well as infectious; and with the education of the public in hygiene. Here to deal with infancy, and there to neglect it; here to have a "stunt" in venereal disease, and there to provide nothing; here to organise a public medical service, and there to leave all things to chance—is not the way either of science or common-sense. Then we require, in much greater degree, to bring together in proper relation the provision of medical treatment in the home, at the clinic, in the hospital,

[1] I may perhaps venture to commend a perusal of Lawrence Lowell's Government of England (2 vols.) or the little volume on The English Constitution by Walter Bagehot (in Nelson's Series), and the three admirable pamphlets on The Business of Government Ministry of Reconstruction, H.M.S.O., No. 38, 2*d*.).

and in the convalescent institution, not for the pauper class only, but for the whole of society. All this means that the profession should help in the consideration of these matters, for, while they constitute only a section of the community of ratepayers, and therefore have only a share in the decision, their knowledge and experience, and the fact that they must in large degree undertake the actual working of any scheme, entitles them to a voice in the form of the scheme. For what sections of the population should provision be made? For what forms of treatment? Under what principles as to availability, adequacy, and payment? What is to be the part or lot of the private practitioner in the undertaking? And, lastly, what does the medical profession say to the concurrent operation of three incomplete and independent public medical services (Poor-law, insurance, and public health), and is it possible to unify their divergent claims? and, if so, what should be the basis of payment and its relative burden on the State, on the local authority, and on the income of the patient.

3. *The Future of the Hospital System.*

A third example of problems awaiting us is that of the hospital position. The number of hospitals in England and Wales in 1915 was reported to be as follows:—

	No.	Beds.
General hospitals	594	31,329
Special hospitals	222	13,654
Fever hospitals	755	31,149
Small-pox hospitals	363	7,972
Poor-law infirmaries	700	94,000

This gives us approximately 2600 hospitals with 178,000 beds, of which 700 institutions and 94,000 beds belong to the Poor-law. In regard to this Poor-law accommodation three things must be said here: first, it is provided out of the poor rate and for persons in receipt of poor relief; secondly, of the 636 Poor-law unions only 54 possess separate infirmaries (of which 26 are in metropolitan unions), 331 unions have "sick" beds in the curtilage of the workhouse, and the remaining 251 unions have no special in-patient accommodation; and thirdly, a large proportion, perhaps even one-third, of the in-patient accommodation in all the Poor-law institutions is empty. These points are important when considering the practicability of transfer of Poor-law beds to the general community. No doubt from the medical point of view the community stands in urgent need of more hospital accommodation—we have overcrowded hospitals and long waiting lists on the one hand, and on the other inability to build new hospitals and yet many empty Poor-law beds. But the solution is not as simple as it looks, and the situation is complicated by many other hospital problems too often overlooked. Let me name some of them. Is the principle of voluntary financial support to continue in our hospital system, or is the profession in favour of Government aid and some measure of Government control? Ought the hospital accommodation of the community to be allocated by the State in respect of area or type of clinical work undertaken, or ought it to continue to be provided in haphazard fashion? Is the medical and surgical staff to remain honorary? Is it to be a special professional class, or composed in part, at least, of general practitioners? What is to be the relation of hospitals to each other and to contributory clinics, and to the insurance system? How are we to bring about the substantial reform of the out-patient departments which is so greatly needed? Ought we to make provision for paying patients, and, if so, on what basis? Can we fairly provide for the insured and the pauper whilst neglecting to provide for the remaining majority? And, lastly, what can be done to reorganise after-care and the proper convalescent treatment of the patient? These are some typical issues which arise, and they are but illustrations, for their right answers they require medical as well as lay judgment and experience.

4. *Medical Education.*

A fourth subject, and perhaps the most important of all, is an adequate method of medical education which shall equip the undergraduate and the practitioner. The new services of the doctor to the State call for a reconsideration of the whole business of education and equipment. A different kind of doctor is needed in these new times. It is clear he must have no less of the learning and skill of former days, whilst he must also be furnished with an improved training in new subjects, in preventive medicine and in the political science of communal responsibility. We are all convinced that the pivot of the profession is the general practitioner. If he is properly equipped the future is safe. Some specialisation of practice there must be, for no man, be his powers what they may, can be master of all branches of medicine. Nevertheless, it is incumbent upon us to recognise that such diseases as tuberculosis and venereal and heart disease will never come under control until and unless the general practitioner is in a position to deal with them. Much of the special provision which has been made by the State in recent years has been necessary, first, because of the need for institutional accommodation to effect cure, and, secondly, because adequate treatment by the private practitioner was unavailable. In my view the State should never take out of the hands of the general practitioner, whether in contractual practice or otherwise, the patient whom he is willing and competent to handle on reasonable terms. The difficulty has been that the practitioner has not been in a position to render the medical service required by the State. It is evident that the solution is dependent partly upon reform in the medical schools—a reform which, happily, is proceeding rapidly—and partly upon adequate arrangements for graduate education for the practitioner, and may I add, willingness on his part to avail himself of the facilities which are provided. There is much remaining to be done in both directions, but before substantial progress can be achieved there is first considerable apathy to be overcome and a fuller apprehension of the needs of the situation; and secondly, the further education of the practitioner must include an adequate professoriate, hospital and laboratory accommodation, and proper organisation.

5. *The Advancement of Humanism.*

As this section is concerned with "Medical Sociology," I venture to suggest one other sphere in which the medical man of this new age may put in his oar. It is not only an intellectual or medical advance of which our country stands in need. Closely akin to it there is a social need. Men are great in proportion as they absorb the best life of the world in which they live—its ideas, knowledge, hope, fears, aspiration—and quicken these anew in the minds of other men. As Sophocles said—

> "Much is there passing strange,
> Nothing surpassing mankind."

No medical man who is in a right sense a man of the world can have failed to ponder often on the near relationship which obtains between the practice of medicine and the social life of the people. It has often been said our patients are not "cases," but men, women, and children, each with a separate personality, environment, heredity, and variation, with individual habits, training, temperament, and psychology. We cannot be wise healers of the patient or the community without a large sympathy and a liberal humanism—that fuller humanity with which the Oxford reformers inspired the Renaissance.

We are the witnesses of a strange and rapid transition in the life of the people as a whole, an enlarging franchise and new social complexes. Higher wages, shorter hours of work, increased leisure, high prices, and democratic aspirations are not remote from the national health and well-being. The doctor must be the missionary of hygiene—the chief educator of the people in the way of health. In being that, he cannot escape his share of responsibility in the study and handling of many of the medico-sociological questions which surround us—education, recreation, housing, the conditions of industry, sobriety, cleanness of living, the prevalence of venereal disease, prostitution, the

penal laws, the causes of certain crimes, the integrity of family life—all such questions concern us, and to fulfil our vows we must be concerned with them. The cultivation of international science, coöperation, and amity should also, I think, be added. It is essential that we should remember that whilst these issues belong to the warp and woof of medical polity the decisive factor is not medical, and movements in favour of their determination on medical grounds only are doomed to failure. Let me remind you of a famous passage in Huxley's lecture at Oxford in 1893 on "Evolution and Ethics." He had been speaking of the cosmic process of Nature, and he said (p. 33):—

Social progress means a checking of the cosmic process at every step and the substitution for it of another, which may be called the ethical process, the end of which is not the survival of those who may happen to be the fittest in respect of the whole of the conditions which exist, but of those who are ethically the best. The practice of that which is ethically best involves a course of conduct which in all respects is opposed to that which leads to success in the cosmic struggle for existence. In place of ruthless self-assertion it demands self-restraint; in place of thrusting aside or treading down all competitors it requires that the individual shall not merely respect but shall help his fellows; its influence is directed not so much to the survival of the fittest as to the fitting of as many as possible to survive. It repudiates the gladiatorial theory of existence. It demands that each man who enters into the enjoyment of the advantages of a polity shall be mindful of his debt to those who have laboriously constructed it; and shall take heed that no act of his weakens the fabric in which he has been permitted to live.

These words are even more timely to-day than they were when they were spoken. He added—

Most men are agreed that the proportion of good and evil in life may be very sensibly affected by human action. ..... So far as we possess a power of bettering things it is our paramount duty to use it and to train all our intellect and energy to this supreme service of our kind.

The claims of the State on the profession have greatly increased owing to the advance of medicine and its manifold applications. A new and closer relationship between them is inevitable. It can be profitable in the public interest only by good understanding. There is something due from each to the other. The profession is responsible for its own contribution—a contribution which consists partly in a correct diagnosis of its own disabilities and the conflicting and prejudicial tendencies within its own body, partly in a fuller understanding of the needs of the State and partly in readiness to make itself thoroughly well equipped and competent to render the remarkable public service which in this generation has fallen to its lot.

THE MYOCLONIC FORM OF ACUTE EPIDEMIC ENCEPHALITIS.

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AT a meeting of the Société des Hôpitaux de Paris on Jan. 23rd Sicard and Kudelsky[1] described four cases of a new affection to which they gave the designation "encephalite aigue myoclonique." The disease as described by them was characterised by the onset of lancinating neuralgic pains with fever, followed by the appearance of short, rapid, explosive, rhythmical, muscular contractions resembling those produced by electrical stimulation. There were no ocular disturbances and no somnolence; on the contrary, insomnia was the rule. Finally, the speech became short and staccato, the gestures automatic, delirium almost constant, the muscular contractions diminished, the patient became comatose and died.

Sicard called attention to the exact resemblance of these cases to the series of cases described by Dubini in 1846, and to which the latter gave the name of electric chorea. Sicard discussed the probable common ætiology of this condition and lethargic encephalitis. Netter in the discussion insisted on the identity of this myoclonic condition with encephalitis lethargica, and stated that he had seen patients presenting the picture described by Sicard pass into the condition of typical lethargic encephalitis.

Following this discussion, reports of similar cases were given by Carnot and Gardin,[2] Œttinger,[3] and Netter.[4] In February, 1920, Briant and Rouquier[5] described seven cases in which delirium and hallucinations were the most prominent symptoms. The patients were restrained with difficulty, were often violent, their features contorted, the face and limbs agitated, with brisk choreiform muscular contractions. Some scratched themselves and tore at the bedclothes. Their speech was scanning. Occasionally they had trismus, slight ptosis, intermittent strabismus, inequality of pupils, retention of urine.

Further instances of such myoclonic and delirious cases, and of cases showing both conditions, in some cases passing into the typical lethargic condition, have been described by Benard and Boissart,[6] Roger and Aymes,[7] Claud,[8] Remond and Minvielle,[9] Eschbach and Belétre,[10] Brouardel, Levaditi, and Forestier,[11] Lereboullet and Foucart,[12] Laporte and Rouzaud,[13] Comby,[14] Bourdillon and Olmer.[15] In Switzerland several observers have also reported similar cases. In America Bassoe[16] has noted delirious forms of lethargic encephalitis, and he and Reilly[17] have both observed twitching of the abdominal muscles. At the meeting of the New York Neurological Society of March 2nd, 1920, Ramsay Hunt[18] reported 12 cases of what he called "acute myoclonus multiplex." Two of these he had seen more than ten years ago and the remaining ten within three months. In the discussion which followed Rosenheck, Leszynsky, Neustaedter, and Leiner reported similar cases. The description of the cases was identical with that given by the French authors.

In Germany Cohn and Lauber[19] have reported eight cases occurring in Stuttgart and similar cases have also been reported by Heiss.[20]

In England no cases of this myoclonic type of encephalitis have, to my knowledge, so far been described, though Buzzard and Greenfield[21] have described similar muscular contractions as a late sequela of lethargic encephalitis.

In the past few weeks three typical examples of acute myoclonic encephalitis, as described by the French authors, have come under my care in the London Hospital. All three presented the combination of insomnia, followed by acute delirium and rhythmical spasmodic contractions of muscles. In all the abdominal muscles were most affected.

CASE 1.—W. S. P., age 17, labourer; admitted London Hospital May 24th. Eight days before admission patient vomited and had severe pains in the lower abdomen and thigh. These increased in severity, and about four days before admission he began to have twitching of the muscles of the thighs and abdomen. He walked to see the doctor (50 yards) on May 20th and again on May 21st. The night of May 22nd and 23rd patient was delirious. He had not slept for a week before admission, and the bowels moved only once in five days, and then only with the aid of an enema. The insomnia was very distressing. For two days before admission there was difficulty in voiding urine.

On admission, temp. 101° F., pulse 100, respirations 36. Patient is in a very restless excited state; eyes bright and staring. Quite conscious, and answers all questions sensibly, but frequently lapses into a low muttering delirium. Face pale, tongue dry, brown, furred, much sordes on gums and lips. Pupils widely dilated, equal, react to light and accommodation. Slight left internal strabismus (said to date from childhood). No facial paralysis, no ptosis. Twitching movements of both extremities and of fingers of both hands.

There are rapid rhythmical shock-like contractions of the abdominal muscles, chiefly the recti abdominales. These occur occasionally bilaterally, but usually confined to one side. The muscle is very forcibly contracted and the umbilicus displaced. These contractions occur at a rate of about 30 to the minute, but the rate and rhythm are irregular. The movements consist of two main varieties, one in the upper segment of the abdomen and the other in the lower. The former consists of sudden contractions of the recti, usually unilateral. The contractions are usually confined to the upper half of the muscle, so that the umbilicus is pulled towards the epigastric angle. Less frequently a similar contraction occurs in the lower half of the muscle. The second main type of movement consists of similar contractions in the oblique muscles, giving a lateral pull in the lower segment of the abdomen.

May 25th: Lumbar puncture: clear fluid; cell count, 17 per c.mm.; protein, very slight increase. The urine contains trace of albumin, but is otherwise negative.

27th: Condition much the same but is more restless and excited. Did not sleep at all last night in spite of morphia and hyoscine. Frequently tries to get out of bed. Bladder distended, requires catheterisation. Bowels have not moved since admission. Pupils widely dilated; sweating profusely. Movement of abdominal muscles continues. Tendon reflexes in arms and legs all normally active. Coarse fibrillary twitchings of the muscles of the extremities. Speech explosive and indistinct.

28th: Seems slightly better, but still has not slept; occasional delirium. Muscular contractions unabated. Requires constant

catheterisation. Temperature 99·2°, pulse 120, respirations 38. W.B.C., 15,000; polys., 75 per cent.; eos., 1·5 per cent.; small lymphocytes, 11·5 per cent.; large lymphocytes, 2 per cent.; large hyaline, 10 per cent.

29th: Distinctly better, quiet, no delirium; still hardly sleeps at all, but occasionally dozes for a few minutes. Myoclonic movements still continue. Patient is wasting rapidly. Temperature 98°, pulse 120, respirations 28.

31st: Slowly improving; now quiet mentally, but still only dozes occasionally; myoclonic movements continue, but are becoming less forcible. Requires constant catheterisation.

June 1st: Steadily improving; slept for a few hours last night. Myoclonic movements in recti continue 30 to 40 to the minute, affecting both upper and lower segments, more often the former. Mental condition clear; no weakness of eye muscles; no facial asymmetry; no disturbance of sensation; no disturbance of sense of position. Tendon reflexes: arms, present; knee and ankle jerks absent on both sides; plantar reflex gives downward movement of the great toe.

3rd: Yesterday not so well. For the past two days there has been evening fever, temperature of 99·6° to 99·8°. Some delirium during the day yesterday, but when spoken to was quite bright and intelligent. Delirium during the night; only became quiet after two injections of morphia. To-day quiet and perfectly rational. Pulse rapid, 140. Pulse has not been below 120 for the past three days. Pulse regular and good volume; heart action shows no disturbance beyond that of rate; area of cardiac dullness not enlarged; heart sounds clear. Pupils no longer dilated. Myoclonic movements of recti muscles continue, intensity about as on June 1st. There are myoclonic contractions of moderate intensity of the hamstring muscles of both thighs. Sudaminal rash over face, chest, and abdomen.

4th: Condition much the same. Quite quiet. Myoclonic contractions of abdominal muscles continue. Speech is sputtering and difficult to understand. Slight fever; temperature 99° to 100° every evening. Pulse continues rapid, 120 to 140. Urine negative.

7th: On the morning of the 5th patient again became restless, excitable, and delirious, and this has steadily increased. This morning he is in a state of wild delirium. He is constantly on the move, grimacing with his face, and throwing his arms and head about. Quite often he will clasp his face with both hands, and frequently with both hands tears at the back of his neck. There is an incessant muttering delirium of which only occasional words can be made out. Sometimes he appears to think that he is boxing. Occasionally he recognises the people about him. He can be roused to understanding and can be made to take food, but to-day has apparently some difficulty in swallowing. Urine only by catheter; incontinence of fæces this morning. The temperature has not been above normal since the evening of the 3rd; pulse constantly 125 and over. The myoclonic movements of the abdomen have ceased; those or the thighs are still present. Morphia has no effect in quieting patient, but hyoscine is more efficient.

Lumbar puncture: clear fluid; cell count, 14 per c.mm.; protein, slight excess.

10th: Mental excitement and delirium continue. Never quiet except when under hyoscine, which seems to be the only drug that is of any value. Even under hyoscine there is almost constant activity. Patient evidently has constant visual hallucinations to which he responds. The arms are constantly on the move in what are evidently purposeful movements. These consist chiefly of what is apparently boxing and gymnastic exercises. (Before his illness patient spent much of his time at a boys' club, and in his delirium he constantly imagines himself there.) He has occasional attacks of violent temper, in which he strikes out at the nurse or whoever is about him. At these times his face assumes an expression of great cunning and malignancy. He can be roused to consciousness, and when roused understands what is said and does what he is told. He is taking his food a little better. The wasting has now become very marked, and the skin over the arms, shoulders, and thighs is raw from the rubbing of the bedclothes during the incessant movements. There are spasmodic contractions of the biceps muscles. The pupils are constantly widely dilated. Since June 6th there has been a marked change in the clinical picture. Before that time the muscular movements dominated the picture. Since that time the muscle spasms have been absent or insignificant, the predominant feature being the restlessness and incessant movement. The patient throws himself about and is for ever on the move.

14th: Since the 12th patient has been lethargic. He lies absolutely quiet with the eyes half open; is roused with difficulty, and can be made to take food only with great difficulty. Face and eyes sunken; emaciation marked; pulse good. For past two days patient has had some cough and sputum, and he is running low evening fever. Very constipated, constant catheterisation necessary.

15th: Died at 3 A.M. to-day. A few hours before death temperature rose to 104·8°.

CASE 2.—F. W., age 6 years, schoolboy; admitted London Hospital May 25th. Five days before admission patient vomited. The next day he complained of sudden pain in the back and lower abdomen and in the thighs; the pain was so severe as to make him cry out. Two days before admission his mother thought he seemed drowsy, and one day before admission he began to have twitching of the muscles of the left arm.

On admission, temperature 99°, pulse 100, respirations 24. Somewhat drowsy, but perfectly intelligent, and answers all questions readily. Pupils dilated, react to light and accommodation. There is no strabismus, ptosis, or nystagmus, and no facial asymmetry. There are forceful rhythmical, shock-like contractions of the lateral muscles of both sides of the abdomen, more marked on the right side. The recti abdominales are not affected. There are similar but more rapid and less forceful contractions of the muscles of the left shoulder girdle and left arm, especially the biceps, deltoid, and pectorals. The bladder is not distended. Tendon reflexes: arms and legs, present; no disturbance of sensation. Heart and lungs negative.

Lumbar puncture: clear fluid, cell count 7 per c.mm. Urine: trace of albumin.

May 27th: Not so well, has not slept at all, and has been restless, excited, and delirious, trying to get out of bed. Eyes bright and staring, pupils widely dilated; no strabismus, ptosis, or nystagmus. Both arms show continuous muscular rigidity, and in both arms rapid rhythmical contractions of slight degree constantly recur at a rate of 70 to 90 to the minute, resulting in fine continuous twitching movements of the arms and hands. The most striking feature, however, is the shock-like rhythmical contractions of the abdominal muscles. These are so forceful as to shake the bed, and can easily be seen from across the ward. They occur at the rate of about 30 to the minute. They consist of shock-like contractions of short duration of the abdominal wall, chiefly of the lateral abdominal muscles. On each contraction the affected side of the abdomen flattens and dips in, pulling in the lower ribs and giving a jerking upward elevation of the pelvis on the affected side. There is no evidence of involvement of the diaphragm, no disturbance of phonation, and respiration continues quite unaffected by these involuntary movements. On palpation the muscles can be felt to undergo strong contraction. There is a striking preponderance of left-sided movements; on admission there was right-sided preponderance. At rest the movements recur at a relatively regular rhythm. At short intervals right-sided movements are irregularly interpolated. Tonic contraction of the abdomen, as evidenced in crying or holding the breath, exercises a very definite inhibitory effect on the contractions.

28th: Patient is highly excited, talking constantly, calling to his friends and brothers. His facial expression is extraordinary, he grimaces constantly, and frequently assumes an expression of low cunning and great malignancy, plucking at the bedclothes, picking his nose, and tries frequently to get out of bed. There are obvious hallucinations of sight and hearing. There is slight internal strabismus. Patient sweating very profusely, beads of sweat over his face. Requires constant catheterisation.

29th: Condition much the same. Very excited, has had to be put in seclusion. Did not sleep at all during the night, restless and excited. Myoclonic contractions continue. At 8 o'clock A.M. temperature 102°, pulse 132. There is a faintly vesicular, miliary, sudaminal rash over the forehead, and especially marked over lower eyelids, upper lip, and chin. This rash is identical with that seen in Case 1. Tendon reflexes in arms and legs not elicited. W.B.C., 21,800; poly., 77 per cent.; eos., 0 per cent.; small lympho., 10·5 per cent.; large lympho., 4·5 per cent.; large hyaline, 5 per cent.

30th: Still excited and delirious, but slept a few hours last night. Muscular movements still present. Answers questions rationally and takes food well.

31st: During yesterday patient gradually grew weaker, finally became comatose, and died early this morning.

CASE 3.—M. N., Jewess, age 28, married, six months' pregnant. Admitted London Hospital, May 26th. One month before admission patient vomited and felt giddy. Then she had a sensation of pins and needles all over her body; this persisted. There was obstinate constipation. For 14 days previous to admission patient has had complete insomnia and is said "never to have slept." Some days before admission she began to have twitching of the muscles and difficulty in urinating. There was some blurring of vislon but no diplopia.

On admission, temperature 101·4°, pulse 100, respirations 28. Patient rational but very talkative and excitable. There are constant rhythmical shock-like movements of the abdomen and occasional twitching movements of the thighs. The pupils are dilated, equal, and react to light and accommodation. There is paresis of the external rectus of the right eye and of the right side of the face, and ptosis of the left lid. Well-marked lateral and vertical nystagmus. Tendon reflexes of arms and legs not elicited, plantar stimulation gives downward movement of the great toe. Abdominal reflexes absent. No disturbance of sensation. Urine negative.

Lumbar puncture: clear fluid; cell count, 6 per c.mm.; protein very slightly increased.

May 28th: Temperature 101·4°, pulse 120, respirations 24. During yesterday morning patient became highly excited, constantly talking, pulling at the bedclothes, and trying to get out of bed. Hyoscine gave no relief and was repeated; following second dose she became quiet and stuporous. Cyanosis marked. Pulse small, rapid, and palpable with difficulty. Following lumbar puncture she again roused, seemed stronger, and grew very excitable. Excitement and delirium persisted all night. This morning she is quieter and seems better. Requires constant catheterisation. Speech is jerky and slurred.

There are forceful, shock-like movements of the abdominal wall recurring in fairly regular rhythm at a rate of about 30 to 40 to the minute. These are predominantly left-sided; in one observation 18 left to 5 right. The movements are exactly as described in Case 2—i.e., a rhythmical sudden flattening of the affected side of the abdomen, with a pulling down of the lower ribs and a lifting upwards of the pelvis on the affected side. The muscles chiefly affected appear to be the lateral muscles of the abdominal wall and the recti abdominales.

29th: Condition unchanged, very restless and delirious, but still has lucid intervals, in which she answers questions quite intelligently. No sleep, in spite of heavy doses of soporifics. Muscular movements unchanged.

W.B.C., 16,800; polys., 77·5 per cent.; eos., 0 per cent.; small lympho., 9 per cent.; large lympho., 7·5 per cent.; large hyaline, 5·5 per cent.; coarsely granular basophilic cells, 0·5 per cent.

31st: Temperature 100°, pulse 100, respirations 28. Yesterday patient was quieter but still sleepless. This morning quieter, semi-comatose, with muttering delirium. Pulse weaker. Muscular shocks as frequent, but less forceful than formerly. Maximum temperature since admission 103°, on the evening of the 29th, minimum morning temperature 100°.

June 1st: Patient has been quiet since yesterday morning, and is now definitely lethargic. She can, however, still be roused, and when roused answers questions intelligently. She at once relapses, however, into unconsciousness with low muttering delirium. The myoclonic movements of the abdomen continue, but much less forcibly than before. Constant catheterisation has been required since May 28th. The eyes are now kept constantly closed and the pupils contracted. There is slight conjunctivitis of the left eye for the first time to-day.

3rd: There was no marked change in patient's general condition yesterday, but she gradually grew worse and died early this morning

Remarks.

It will be seen that these three patients, admitted to the London Hospital within a period of three days, presented a clinical picture of striking similarity, and one which conforms accurately with the descriptions of acute myoclonic encephalitis in the foreign literature. In all three cases the initial symptom was vomiting, followed in two of the three patients by severe pain in the lower abdomen and thighs. There was obstinate constipation and difficulty in urination, followed in every case by complete retention. Insomnia was severe and led up to a wild delirium of the delirium tremens type; in one patient the insomnia was preceded by drowsiness. In all cases the most striking feature was the forceful, shock-like contractions of the abdominal muscles, which occurred at the rate of 30 to 40 to the minute. The pupils were widely dilated, there was profuse sweating and tachycardia. Fever, usually of low degree, was present in all. In two of the three speech was affected, jerky, indistinct, and slurred. Paresis of the eye muscles was present in one case and doubtful in another. One patient showed nystagmus. All three patients showed a well-marked leucocytosis, with a slight relative increase of the polynuclears. The urine showed a trace of albumin in two cases. The spinal fluid showed a very slight increase of cells and protein in all three cases, in two of these barely above the possible normal variation. In all three patients the disease was fatal.

Autopsies were obtained on two of the three patients. There were no gross lesions to be seen, except a moderate degree of cerebral congestion. Histological examination has not yet been completed, but will be reported in due course.

Two points observed in these patients do not seem to have been hitherto described—the leucocytosis and the dilatation of the pupils. It is interesting that with the onset of coma the dilatation of the pupils disappeared.

That these myoclonic cases are really epidemic encephalitis caused by the same ætiological agent as the lethargic form remains, of course, yet to be proved. But epidemiological and clinical evidence certainly strongly suggests their identity, and the scanty histological observations as yet available support this opinion.[24] It is worthy of note that all three of these patients became comatose before death, the condition in Case 3 being indistinguishable from that of an ordinary case of lethargic encephalitis. On the other hand, the occurrence of a leucocytosis in these cases is of interest, as in the lethargic forms Vaidya and Boyd[22] and Edwin Bramwell[23] have found no such increase of leucocytes. This point of difference would therefore seem worthy of further investigation, especially as in our cases no complicating factors which would explain the leucocytosis were present.

If the ætiological agent is the same, the occurrence of this new form of case, which in the opinion of the French authors amounts to a fundamental change in the type of the disease, is presumably associated with a tendency of the virus to new localisation in the central nervous system. Such a change is of profound interest, both in the general problem of specific localisation of infections, and in the narrower problem of the change of characteristic localisation of a given infection during its epidemic evolution. The fundamental principles underlying these problems remain as yet almost unsuggested.

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SUPPRESSION OF URINE IN PREGNANCY AND THE PUERPERIUM.

ITS RELATION TO SYMMETRICAL NECROSIS OF THE RENAL CORTEX.[1]

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SUPPRESSION of urine is a very rare complication of pregnancy or the puerperium, but it is an extremely dangerous one. It has been my fate to have seen 12 cases, and 6 of these have been proved by post-mortem examinations to have been due to symmetrical necrosis of the renal cortex. Particulars of five of these cases of necrosis have already been published in *The Lancet* and *Journal of Pathology*; the sixth case is described below in full, and also a case of suppression of urine from chronic interstitial nephritis. I have also seen another case of eclampsia with suppression of urine which I believe was one of cortical necrosis, but I was unable to obtain a post-mortem examination of the kidneys. I have not included the case in this paper.

As suppression of urine is an outstanding feature of symmetrical cortical necrosis I append notes of some of those other cases which I have seen from the clinical aspect only, so that they may be compared and contrasted with those that have been proved post mortem. Two occurred during pregnancy, and but one—a partial suppression only—recovered.

CASE 1. *Complete suppression of urine at the seventh month of pregnancy; fatal.*—Mrs. McA., primigravida, aged 22, about seven months pregnant, was transferred after a few hours in the Glasgow Royal Infirmary to the Maternity Hospital on March 14th, 1906. On admission the patient was conscious but very restless, and frequently asked for a drink. Her right arm was quite limp; the pupils were equal, active, and normal in size. The pulse was 132 and very weak. The heart sounds were pure. The uterus was about the size of a seven months' pregnancy. No fœtal heart sounds could be heard. The breech presented. The patient could not give an account of her condition previous to admission, but her husband stated that for three months there had been swelling of the legs and that she had not been able to do housework. During the last two weeks she had complained of dizziness and headache at times. There had not been any convulsions, but her husband had noticed twitchings of her face just before she was taken to the Royal Infirmary. Half an ounce of urine was obtained by catheter. It was heavily loaded with albumin and contained granular casts.

The treatment consisted of free purgation, saline transfusion, and stimulation. The bowels moved freely, but no more urine was excreted. No convulsions occurred. She died ten hours after admission. We were unable to ascertain how long the suppression had lasted, and unfortunately we could not get a post-mortem examination.

There may have been cortical necrosis, but I am inclined to think it was a case of chronic nephritis, similar to Case 11. The three months' swelling of the legs, dizziness, and headache, point to this.

CASE 2.—*Partial suppression of urine at 6½ months of pregnancy; recovery.*—Mrs. P., primigravida, aged 37, about 6½ months pregnant, was seen by me in consultation with Dr. W. Clow, of Paisley. There had been nothing unusual in the early months of the pregnancy, but on April 7th, 1906, slight bleeding had commenced. The patient was kept in bed for three weeks, and there was a slight "show" of blood all this time. On May 1st swelling of the legs began and slight swelling of the hands and face. By May 5th the swelling had increased, but a careful examination of the urine gave no trace of albumin. Seven days later the urine was found to be heavily loaded with albumin, and to contain tube casts but no blood. The swelling of the legs had increased, and the patient had had headaches occasionally and had vomited once. On May 14th the albumin amounted to 12 per 1000 (Esbach), and on the 16th to 9. She was taking a diuretic and the bowels were being kept freely opened. On May 16th the patient became very excited, and complained of violent headache. About 8 P.M. she became delirious and apparently quite blind. Dr. Clow at once bled her from the arm to the extent of 20 oz. There was immediate improvement of the sight and of the mental condition, and the headache lessened. May 17th: During the night there was much wandering and vomiting occurred seven times. Patient did not know anybody. No urine had been passed since 10 P.M. on the 16th. She was put into a hot pack in the afternoon. I saw her about 5 P.M. She was very

[1] A paper read before the Edinburgh Obstetrical Society on May 12th, 1920.

restless, and continually muttered words which I could not understand. She would not reply when spoken to. No urine had been passed for 19 hours.

She was given 30 oz. of saline solution (acetate and chloride of sodium) under the right breast, and delivered by dilating the cervix by means of Bossi's dilator. There was lateral placenta prævia. I did bipolar version and perforated the aftercoming head to lessen the strain on the cervix. There was very little bleeding and no tearing of the cervix. Twelve ounces of urine were obtained by catheter. Next morning 24 oz. of urine were drawn off, and in the evening 36, so the kidneys were acting well and continued to do so. In a fortnight there was only a faint trace of albumin to be found.

In this case there was only partial suppression, but there was a marked toxic effect indicated by the blindness, delirium, and vomiting. There were no fits, but to all intents and purposes it was a case of eclampsia. Dr. Clow probably saved this woman's life by bleeding her so freely. Perhaps it would be more accurate to describe this case as one of marked diminution in the secretion of urine, as there never was complete suppression. I think it was a case of the kidney of pregnancy with very marked toxæmia. If there had been chronic nephritis present I do not think the result would have been so good.

CASE 3. *Suppression of urine after Cæsarean section; fatal.*—The Cæsarean section was done for a badly contracted pelvis. When a catheter was passed some hours after the operation 3 oz. of urine were obtained. It was very dark in colour and showed evidence of carboluria. The abdomen had been prepared by a carbolic dressing, and the gauze swabs had been wrung out of a weak carbolic lotion. Next day 9 oz. of urine were obtained. It was clear, but contained albumin and tube casts. Next day 11½ oz. were obtained in 12 hours, and only 2 oz. in the following 12 hours. From that time until death over three days later only 1 drachm of urine was secreted. The albumin had lessened considerably.

Most active treatment was tried, including various diuretics, free purgation, vapour baths, saline transfusion, cupping, and poulticing over the kidneys and bleeding. She gradually became more and more comatose, and there was a distinct urinous odour from her breath. Just before death she had a violent general convulsion which lasted for about one minute.

The pathological examination of this case, which occurred some 22 years ago, was done by Dr. R. M. Buchanan, and the following details are extracted from his report:—

The capsules of both kidneys were slightly adherent, and the cut-surfaces showed well-marked congestion, particularly the pyramidal areas, which contrasted with the pale yellowish but red-streaked cortex. Microscopical examination showed that the tubules of the cortex were almost uniformly dilated, the epithelium compressed, and the lumen filled with granular material. A number of the straight tubules were also dilated and occupied by similar granular material. The malpighian bodies and the blood-vessels appeared normal. The liver showed chronic venous congestion.

From this report it is evident there was chronic nephritis present, but not in such a marked degree as in Case 11. I reported this case to the Edinburgh Obstetrical Society in 1898 (Vol. XXIII. of Transactions). In the many hundreds of Cæsarean sections which have been done in the hospital this is the only one in which suppression of urine occurred.

CASE 4. *Suppression of urine after a normal labour; fatal.*—The patient, a primipara, aged 19, was delivered of a live female child by natural efforts after a labour of 12 hours' duration. On admission a catheter was passed, but the bladder was empty, so no specimen was obtained for examination. During the first few days of the puerperium a considerable quantity of urine was voided, but it was not examined, as it was contaminated with lochial discharge. The patient did not complain, but she had a greyish appearance and looked decidedly ill. She was not septic and the heart and lungs were normal. A catheter was passed on the sixth day of the puerperium, and about ½ oz. of urine was obtained. It showed a deposit of ½ of albumin and a large number of granular casts. Previously to the passing of the catheter the urine had been freely excreted, but from that time onwards there was complete suppression, with the exception of 2 drachms three days later. She died on the fourth day of the suppression. Towards the end the breath had a distinct urinous odour and hiccough and retching occurred. Just before death she had a slight convulsion.

The treatment consisted in the use of diuretics, cupping, hot packs, purging, pilocarpine, and amyl nitrite.

No post-mortem examination was allowed. The presence of the granular casts indicate that nephritis was present. The case was probably the same as Case 11, to be described.

The clinical and pathological accounts of Cases 5 and 6 have already been published in detail in the *Journal of Pathology and Bacteriology*, Vol. XV. (1911), and in the Transactions of the Edinburgh Obstetrical Society, Vol. XXXI. Cases 7, 8, and 9, were fully recorded in THE LANCET, 1913, i., 615, and in the Transactions of the Edinburgh Obstetrical Society, Vol. XXXVIII. The essential features only of these cases are abstracted here.

Nos. 5, 6, 7, 8, 9, and 10 were cases of cortical necrosis and ended fatally.

CASE 5.—The patient, a 7-para, aged 36, was seven and a half months pregnant when she was admitted to hospital suffering from fits, unconscious, and with considerable œdema of face, legs, and lumbar region. The urine was loaded with albumin, becoming almost solid on boiling. She was at once bled to the extent of 12 oz., and 2 pints of the usual saline solution transfused. A hot pack was applied, the stomach washed out, and salts and chloral hydrate given. Next day 35 oz. of urine were passed containing 1 per cent. albumin and tube casts, and on the following day a dead fœtus was born. The urine obtained on this morning contained 0·2 per cent. albumin, but from about mid-day suppression of urine became complete except for the passage of ½ oz. of urine two days later and 1 oz. three days later. Patient was quite conscious and clear mentally by this time, and decapsulation of the right kidney was performed on the following day. Patient became restless after the operation, complaining of abdominal pain, but there were no convulsions. She died ten hours after the operation, there having been about five and a half days anuria.

CASE 6.—The patient, aged 22, was eight months pregnant when admitted to hospital suffering from œdema of feet and legs of several weeks' duration. She had had eight fits during the four hours preceding admission, and with the onset of the fits she had become totally blind. On admission her condition seemed to be very critical. The œdema was marked and the face bloated. She was unconscious, restless, and passed urine and fæces involuntarily. Four more fits occurred in rapid succession. She was bled, given a saline infusion, and a rectal injection of chloral and bromide, and put into a hot pack. The urine was found to contain abundant albumin, a trace of blood, and granular tube casts. She improved somewhat and next day gave birth to a dead child of 4¾ lb. Twelve ounces of urine had been passed in 24 hours. On the following day she was worse and the face and extremities were cold and livid, not unlike a degree of Raynaud's disease. She had no more fits, but made no progress, and died some seven days later, the suppression of urine persisting. The suppression was almost but not absolutely complete, as 1–2 oz. of urine were obtained each day.

CASE 7.—The patient, a 9-para, seven months pregnant, was admitted to hospital, extremely blanched and collapsed, suffering from concealed accidental hæmorrhage. There had been œdema of feet and legs for two weeks and abdominal pain for one week before admission. Saline infusion was given and stimulants were administered freely. The patient rallied and in about three hours delivered herself of a dead 3½ lb. fœtus. The placenta was unhealthy and the chorion partly adherent necessitating removal. A large amount of blood clot was expressed. The patient improved after delivery, but suppression of urine remained complete from admission. The bladder had been found empty when a catheter was passed on the day of admission, and the patient stated that the last time she passed urine was about 12 hours before admission. The loins were cupped and poulticed, rectal salines administered, and the bowels kept freely open by magnesium sulphate. The complete suppression persisted, but the patient remained quite conscious and suffered no inconvenience except for occasional attacks of dyspnœa. There were never any convulsions, but the dyspnœic attacks became more frequent and she eventually died four and a half days after the onset of the complete suppression of urine.

Although there had been no convulsions the case was looked upon as being of this nature and the typical eclamptic lesions were found post mortem. A number of other cases in which all the indications of eclampsia were present except convulsions have come under my observation, and in one, which proved fatal, Dr. Kennedy found post mortem the lesions typical of eclampsia. It is interesting to note that this case of suppression (Case 7) was a case of concealed accidental hæmorrhage. By some, toxæmia of pregnancy is held to be the cause of accidental hæmorrhage, and there is no doubt that it is present in some of them.

CASE 8.—The patient, aged 38, 2-para, was admitted to hospital suffering from œdema of feet and legs of six months' duration and bad albuminuria. The urine was loaded with albumin and showed pus cells and granular casts. On the following day live twins of 4 lb. and 4½ lb. respectively were delivered spontaneously. In the next 24 hours only 1 oz. of urine was excreted; the patient's face became œdematous, and persistent vomiting was troublesome. The next day the patient became semi-comatose, and but 1 oz. of urine was excreted. Early in the following morning the patient had a convulsion in which she died. This was the only fit, and the suppression of urine had lasted about 2½ days. The treatment adopted was free purgation, salines by infusion and by the rectum, and free stimulation.

In this case it may also be urged that, as the only convulsion occurred immediately before death, it was not a case of eclampsia, but one of uræmia. From the clinical point of view the case was considered to be one of eclampsia, and the post-mortem findings confirmed this diagnosis.

CASE 9.—The patient, a primipara, 4½ months pregnant, was admitted to hospital under the care of Professor M. Cameron, with œdema of the face of several weeks' duration and severe headache, vomiting, and failure of vision since the day before admission. On the day of admission to hospital she became somewhat comatose, and had several fits. The urine contained so much albumin that it became solid on boiling. The uterus was emptied, two pints of saline given subcutaneously, the stomach washed out, magnesium sulphate and bromide and chloral hydrate administered. There were no more fits, and for two days she kept well and passed a fair quantity of urine. A day later, however, she began to vomit blood, and complained of epigastric pain, and was troubled with hiccough. Vomiting of blood-stained fluid persisted during the following day, and tarry motions were passed. The vomiting ceased the next day, but the hiccough persisted. The urine was now becoming scanty in amount, and some abdominal distension and tenderness over the stomach were observed. By the following day complete suppression of urine had set in, and death ensued a day later, the complete suppression having been under two days in duration.

CASE 10.—Mrs. D., 7-para, aged 48, was admitted to hospital on Dec. 31st, 1918, at 7.40 A.M., having being delivered before admission. She was unconscious and had had seven fits. Shortly after admission she had one fit, but no more. All her other labours had been normal, but in her sixth pregnancy there had been ascites and

albuminuria. The urine had not been examined during the seventh pregnancy so far as we could ascertain. The stomach was washed out, magnesium sulphate administered, and two pints of saline solution given under the breasts. There was no urine in the bladder. The face was puffy, but the legs not much swollen. Mustard and linseed poultices were applied over the kidneys. There was no tenderness in the renal region and the patient did not suffer

FIG. 1.

Kidney from Case 10 (5½ days' suppression of urine), showing the more or less uniform necrosis of the outer two-thirds of the cortex separated from the living inner third by a hæmorrhagic zone. At intervals from this zone of congestion numerous strands pass out to the surface. The necrosed area also involves the interpyramidal cortex. Both kidneys present similar characteristics.

any inconvenience. On Jan. 3rd dry-cupping was tried, and on the 4th both kidneys were decapsulated by Mr. J. H. Pringle. The patient died the next day, the anuria having lasted about 5½ days.

The result of the pathological examination (A. M. K.) was as follows:—

The body is that of a well-developed, well-nourished, fat woman. It is anæmic-looking, and the face looks a trifle puffy, but there is no œdema of the feet or legs, or elsewhere. There are recent operation wounds in both loins over the kidneys.

Head: No gross œdema of the meninges. Blood-vessels healthy, and no thrombosis in any sinuses. On section two small hæmorrhagic foci, of recent origin, each about the size of a lentil, found about the middle of the upper half of the left side of the pons. Nothing further abnormal in the brain. Microscopical examination of sections prepared from the pons confirmed the findings of the P.M.—viz., the presence of two small hæmorrhagic foci. The larger of the two looked as if it were made up of hæmorrhages from several minute foci rather than from one larger focus, as some of them seemed to be surrounded by areas of degenerate brain tissue, demarcating them from the others. A few small capillaries in the neighbourhood of some of the foci were seen to be thrombosed. Microscopical examination of sections from the cerebrum showed nothing of note.

Thorax: Heart is slightly dilated, muscle soft and rather anæmic. Valves healthy and coronary arteries normal. Microscopical examination: Slight general fibrosis of the myocardium.

Lungs: Slight emphysema anterior margins and slight hypostatic congestion and œdema at both bases behind; these findings confirmed later by microscopical examination. Pleuræ appear healthy.

Abdomen: No free fluid present; no hæmorrhages under the peritoneum and no peritonitis. Liver: About normal in size, but appears somewhat fatty. On section, lobules unduly prominent as if there were an excess of interstitial tissue surrounding areas a little larger than a pin's head. No hæmorrhages of any kind under capsule or in substance of liver, and no dilated capillaries visible. Microscopical examination: No areas of focal necrosis or hæmorrhages found, and no thrombosis. Some fatty infiltration present, as shown by fatty globules in the cells at the periphery of a number of the lobules, but of moderate degree only. Capillaries between lobules and in peripheral lobular zones distended in many places, although for the most part somewhat empty of blood. This gave an apparently œdematous look to the connective tissue in these situations and accounted for prominence of lobules noted at the necropsy.

Spleen: Slightly enlarged, pulp full but not septic. Uterus: Evidence shown of recent delivery; one or two small shaggy pieces of placental remains, each a little larger than a pea, still attached to the fundus. Bladder is quite empty. With the exception of the kidneys, all the other abdominal organs healthy.

Kidneys: Both kidneys are somewhat enlarged and show similar characteristics. The capsules have been stripped off completely at operation, and several small pieces of blood-clot are found adhering to the surfaces. The surfaces generally are opaque and pale yellowish-white, but mottled all over with small reddish areas. On section the relative thickness of cortex and medulla appears about normal. The outer two-thirds of the cortex is dull opaque and pale yellowish-white in colour, and apparently completely necrosed. The innermost third of the cortex looks more like living tissue, and is well demarcated off from the necrosed outer two-thirds by a distinct hæmorrhagic zone. At intervals from this zone of congestion small strands of congestion pass into the outer necrosed area, and reaching the surface constitute the reddish mottled areas visible under the capsule. The necrosed area is not confined to the peripheral cortex, but extends into the interpyramidal portion, and everywhere is limited internally by the hæmorrhagic zone, the relations being the same throughout, and a narrow zone of apparently healthy cortex lying immediately next the medulla. At no place can any living tissue be traced passing from the medulla outwards to the surface. The renal arteries are not apparently thickened nor thrombosed, and the pelves and ureters are normal. The condition appears to be one of widespread pale infarction involving approximately the outer two-thirds of the renal cortex, and affecting both kidneys symmetrically.

Microscopical examination: Sections were prepared from several portions of the kidneys and stained with hæmalum and eosin, hæmalum and van Gieson, and carmalum-Gram-Weigert. At the surface immediately under the capsule there is an extremely narrow layer of living tissue, which, however, is not quite uniform. For the most part this layer consists of the fibrous-supporting tissue of the parenchymatous elements, and appears to be in greater amount than normal. It is broken up at many places by the necrosis extending right up to the surface. Between these places, extending a short distance into the kidney, are seen flat wedge-shaped areas in which the parenchymatous elements—tubules and glomeruli—are less necrotic than elsewhere, although many of the tubules are atrophied and a few of the glomeruli appear simply as fibrous tufts. Loose infiltration with polymorph leucocytes is also

FIG. 2.

Microphotograph (× 90) of kidney from Case 10 (5½ days' suppression of urine), showing a dilated and thrombosed interlobular artery near the marginal zone and a thrombosed efferent branch to one of the glomeruli. The section was stained by carmalum-Gram-Weigert specially to show the fibrin. The widespread degeneration of the tubular epithelium, as well as the changes affecting the glomeruli and interstitial tissue, are apparent. Some loose infiltration with leucocytes is just visible.

present. In many of these wedge-shaped areas the capillaries show very marked congestion, and correspond to the small reddish areas seen by the naked eye as mottling the otherwise opaque yellowish-white surface. At no place is there any living tissue connecting the medulla with the surface.

In the infarcted area all the structures are in a stage of practically complete necrosis; the cells have become broken up and granular, and the nuclei have disappeared altogether. The outlines

of tubules and glomeruli, however, are still distinct. The greater part of the infarcted area shows coagulation necrosis without any sign of reaction, except in the marginal zone, where the congestion is present. Here the interstitial tissue around the tubules and glomeruli are loosely infiltrated with polymorphonuclear leucocytes, which, however, only penetrate into the periphery of the paler necrotic areas, in which situation many of the leucocytes are seen to be degenerate also.

In the marginal zone there are much congestion and some hæmorrhage. Many of the glomeruli are gorged with blood. As seen by the naked eye, strands of congestion can be traced at intervals passing to the surface, where they form patches of congestion under the capsule. In the marginal zone some of the tubules show a

FIG. 3.

Microphotograph (× 90) of pons from Case 10 (5½ days' suppression of urine), showing one of the hæmorrhagic lesions. Some hæmorrhage is visible in the centre of degenerate brain tissue. Capillaries in the neighbourhood were found thrombosed.

certain amount of degeneration of their epithelium—the epithelial cells being somewhat granular and their nuclei staining less deeply than usual.

In the infarcted area all the blood-vessels are thrombosed, and share in the general necrosis. Here and there, however, there are some less necrosed, and these are seen to be dilated and plugged with fibrinous thrombi. In the marginal zone bordering the necrotic tissue and in the hæmorrhagic strands passing to the surface the interlobular arteries and their branches to the glomeruli are dilated and occupied by thrombi. The thrombi consist for the most part of fibrin. Some of the vessels appear to be filled with dense fibrin; in others the fibrin appears as a filamentous meshwork lining the walls and surrounding apparently living red blood cells in the centre of the vessel. In some others, again, the central part of the vascular channel seems to be occupied by amorphous material in which the degenerate remains of a few red cells can just be made out, whereas at the periphery fibrin is deposited as a lining to the vessel wall. The larger vessels of the vascular arches are not affected. Many of the small straight vessels of the medulla are congested and a number of the medullary tubules appear to contain hyaline casts.

The kidneys had not previously been absolutely healthy organs, for there is some evidence of arterio-sclerotic changes. A number of the arteries show periarterial fibrosis and a few also show slight thickening of the internal coat. In places a few of the glomeruli are seen to be converted into dense fibrous tufts and at the surface a slight increase of the fibrous tissue has already been noted.

CASE 11. *Suppression of urine from chronic nephritis; fatal.*—Mrs. McD., 3-para, aged 34, seven months pregnant, admitted at 12.30 A.M. on July 6th, 1919, suffering from suppression of urine, which had lasted for 12 hours. Her family history was good, and she had never had any serious illness except at her previous confinements. At the first confinement (seventh month) she had had several fits, with swelling of the legs and face during the pregnancy and severe headache. The child had lived three weeks. Her next labour had been normal, but she had had one fit. During the present pregnancy she had apparently been well until 24 hours before admission, when her left leg began to swell and the urine was noticed to be scanty; none had been passed for 12 hours. There was slight œdema of the left leg. The lungs and heart were normal. The fundus was at the umbilicus. No urine was obtained.

At the time of admission the os was not dilated, but at 2 P.M. there was a sudden hæmorrhage and lateral placenta prævia was found to be present. The membranes were ruptured, version done, and a foot brought down. The delivery was left to nature and occurred some eight hours later. There was considerable hæmorrhage, checked by ergotin. Two pints of normal saline solution were given and hot packs applied. As there was still complete suppression of urine on the following day Mr. Pringle decapsulated both kidneys within 48 hours of the onset. Both kidneys were curiously mottled and granular in appearance when the capsules were stripped off. 8th: Next day the patient was given 10 grains of diuretin every four hours, but there was no urine secreted. 9th: One ounce of urine was obtained. It contained albumin, red blood corpuscles, and granular casts. 10th: Four ounces of urine obtained. The dressings, which were saturated with urine, were changed, and the drainage-tubes were cleaned and shortened. The patient vomited frequently coffee-ground-like material. Her pulse was very good, and she was quite conscious. 11th: Five ounces of urine were obtained by catheter; it still contained albumin and casts, hyaline and granular. The vomiting continued. Two pints of saline were given under the breasts. The pulse, which had been full and strong throughout, began to fail in the afternoon. Strychnine was given, but the weakening of the pulse continued, and the patient became comatose. She died just after midnight. Ten ounces of urine had been obtained from the bladder since the operation, and in addition the dressings had been saturated with urine.

She was admitted on the 6th at 12.30 A.M. after 12 hours of suppression and died on the 12th, just after midnight, so the suppression had lasted 6½ days. A general post-mortem examination was not allowed.

The result of the pathological examination (A. M. K.) was as follows:—

The kidneys are a little under normal in size and are firm and dense. The surfaces are roughly granular, being studded all over with small rounded elevations of a greyish-yellow colour. The depressions between these prominences are darker. The capsule was apparently somewhat thickened and, although for the most part it has been stripped off, in places it has apparently split leaving a layer adherent to the surface. On section the cortex is seen to be narrowed fairly regularly all round. It is for the most part opaque and greyish-yellow in colour, but mottled with small dark congested areas. The arteriæ rectæ seem congested. The renal arteries are thickened and there is some increase of the fat in the neighbourhood of the renal pelvis.

Microscopical examination showed a general increase of the interstitial connective tissue throughout the kidney and which in places is somewhat cellular and more abundant than in others. Many of the glomeruli show thickening around their capsules and others are completely fibrosed, particularly those near the surface, the tufts being completely converted into dense fibrous nodules. The tubules in the areas where the fibrosis is most marked are atrophied and collapsed and their cells more cubical. In other places many of the tubules are dilated, the epithelium appearing somewhat flattened and granular. The nuclei are for the most part well defined, but are sometimes rather indistinct, and occasionally have disappeared where the epithelium is particularly degenerate. The arteries are slightly thickened and show well-marked peri-arterial fibrosis. The microscopical appearances are typically those of a chronic interstitial nephritis.

Remarks.

When we look at these cases collectively we find this feature in common—that they all suffered from what is known as the toxæmia of pregnancy. The cause seems to lie in the action of a toxin, and if there is chronic interstitial nephritis present there is grave risk of suppression of urine. In the cases of cortical necrosis there is always marked toxæmia present. As to how the thrombosis is brought about I can hazard no opinion.

When suppression of urine is fairly established treatment by medicines, transfusions, &c., seems hopeless. Decapsulation of the kidneys in cortical necrosis has done no good, and one cannot see how it can be of any use. In a case of nephritis, as in Case 11, it might do some good. In that case there was some urine secreted, and the patient lived longer after the operation than any of the cases of necrosis operated upon, but the result was the same.

I am afraid that it is impossible to differentiate between cortical necrosis and chronic nephritis, and it is quite apparent that the two may coexist. A history of previous nephritis would argue against necrosis. The only hope is in prevention, by the careful early treatment of toxæmia of pregnancy.

Summary and Commentary (A. M. K.).

Of the 11 cases noted above, pathological reports on the condition of the kidneys are available in 8 instances. Two of these showed chronic interstitial nephritis only. In the one (Case 11) the condition was well marked—the surfaces of the kidneys being roughly granular, with narrowing of the cortex and thickening of the arteries, and general increase of the interstitial connective tissue throughout; in the other (Case 3) the changes were less

marked, but from the report of Dr. R. M. Buchanan, who made the investigation some 22 years ago, it would appear that the capsules were adherent, the tubules dilated, and their epithelium compressed. The remaining six cases were examples of symmetrical cortical necrosis of the kidneys. In three (Cases 7, 8, and 9) the condition was uncomplicated by any pre-existing disease in the kidneys, the organs showing no changes beyond those associated with the necrosis. In the remaining three, however, the kidneys, prior to the onset of the necrosis, had been the seat of chronic changes of varying degree. The first of these (Case 5), examined by Professor J. H. Teacher, showed that there had been a slight subacute interstitial nephritis pre-existing, the connective tissue in the kidneys being increased in amount and in places rather cellular, and the tubules irregularly dilated. In the second (Case 6), also investigated by Professor Teacher, the old-standing lesion was trifling, there being only very slight endarteritis of the smaller cortical arteries. In the third case (Case 10) the kidneys had been the seat of slight arterio-sclerotic changes. Periarterial fibrosis could be made out and occasionally very slight endarteritis; in places a few of the glomeruli were transformed into dense fibrous tufts, and at the surface little flat wedge-shaped fibrous areas could be made out in which the tubules were atrophied.

From the foregoing series of cases it would appear, therefore, that suppression of urine in pregnancy or the puerperium may be dependent upon chronic interstitial nephritis, or be the result of symmetrical cortical necrosis of the kidneys. Of course, in chronic interstitial nephritis suppression of urine may be met with apart altogether from pregnancy, but symmetrical cortical necrosis would appear to be peculiarly related to the pregnant state. The necrosis may affect kidneys that show no antecedent chronic disease; but old-standing interstitial nephritis or arterio-sclerosis may be present, and, while one is not justified in assuming that the symmetrical cortical necrosis is particularly liable to affect kidneys which are already the seat of chronic changes, it must be recognised that arterio-sclerosis may have some predisposing influence on the occurrence of thrombosis.

Of the six cases of cortical necrosis of the kidneys focal necrosis was found in other organs in five. In three focal necrosis was obvious in the liver, the fourth showed it in the suprarenals and intestines, and in the fifth lesions were found in the pons. No microscopical report on any of the organs other than the kidneys is available in the sixth case (Case 5 of series).

The occurrence of focal necrosis in various organs of the body is one of the features of the pathology of eclampsia, the liver being the organ in which the changes have been most frequently noticed. It would appear, therefore, to be justifiable from the pathological point of view to regard these cases of cortical necrosis as falling into this category. Clinically they were all regarded as being of this nature.

The distribution of the cortical necrosis is noteworthy, involving as it does the outer two-thirds of the cortex. This would appear to have some relation to the vascular supply, for the large vascular arches in the inner part of the cortex are unaffected, whereas the smaller cortical branches are thrombosed.

In the majority of the cases the necrosis is more or less complete, but in Case 9, where the suppression of urine had lasted only 1½–2 days, the renal lesions were early and give some indication as to how the condition begins. In this case the necrosis in the outer two-thirds of the cortex was of a patchy nature, and the patches were of varying size. Thrombosis of the cortical blood-vessels was not a striking feature. Capillaries in several of the necrotic areas were found thrombosed, but only rarely were any of the arterioles affected. This is rather a striking feature, and contrasts with the other cases of longer duration in which thrombosis was conspicuous, and extended into almost all the cortical vessels above the vascular arches. There is, therefore, some grounds for the view that the thrombosis begins peripherally and spreads inwards towards the proximal end of the interlobular arteries. Professor E. E. Glynn,[2] in 1915, describing the pathological findings in a case of cortical necrosis, drew special attention to the presence of blood platelets in the thrombi, particularly in the distal portions, and he considers that the immediate cause of the thrombosis is the deposition of platelets and fibrin in the distal end of the interlobular arteries, their afferent branches, and the glomerular capillaries. He points out that injury to the vascular endothelium is one of the commonest causes of thrombosis, such injury leading to the deposition of platelets and fibrin appearing later. Granted that damage to the vascular endothelium is the immediate cause of the thrombosis, the agency responsible for the damage remains to be determined.

In three of the cases of symmetrical necrosis included in the present series, a certain amount of arterio-sclerosis was present in the kidneys—in two it was very slight, in one it was moderately extensive. The possibility of such arterio-sclerosis predisposing to thrombosis must be admitted, but it is obviously not the prime factor, for in the other three cases no arterio-sclerosis was found. In every case the thrombosis is only found in the neighbourhood of the necrotic tissue, so it would appear that either the one is dependent on the other or both are due to a common factor. Degeneration and necrosis of the renal epithelium are met with in cases of acute nephritis due to causes other than pregnancy, but similar thrombosis is not found in them. It would not appear, therefore, that necrosis of the renal epithelium, per se, produces thrombosis. Further, in fatal cases of eclampsia an almost constant feature is focal necrosis in various organs of the body, but chiefly in the liver, and these are frequently associated with capillary thrombosis. The eclamptic toxin appears to be a very complex body made up of several constituents; hæmolytic (cytolytic), endotheliolytic, and thrombotic elements have all been suggested as component elements. It seems clear, then, how such a toxin could be responsible for the focal necrosis and thrombosis in various organs, and it is only rather surprising that symmetrical necrosis of the kidneys is not more frequently met with. There is the possibility that in the great majority of cases of eclampsia the toxin is modified or altered in some way, perhaps in the liver, before it is excreted by the kidneys, and that it is only in those cases where it passes to the kidneys unaltered or in such concentration as to cause the widespread cortical necrosis and thrombosis in these organs.

Treatment.

The question of treatment of cases of suppression of urine in pregnancy is a difficult one, and will remain so until the whole problem of the pathology of the toxæmia of pregnancy has been solved. We have seen that the suppression may be dependent, on the one hand, upon a chronic nephritis only, or, on the other, upon a symmetrical cortical necrosis involving kidneys which had been quite healthy or were already the seat of chronic changes.

In a recent review[3] on "Decapsulation and Nephrotomy for Nephritis" decapsulation and nephrotomy are advocated for those cases of suppression of urine in pregnancy or the puerperium which are due to symmetrical cortical necrosis. It is considered that these cases should be distinguished from eclampsia, and that it is the stillbirth which occasions an acute toxic exudation within the capsule of the kidney causing tension which may be relieved by bilateral nephrotomy and temporary drainage as soon as anuria sets in. The writer of the review does not think time should be spent in medical treatment. We are not inclined to agree with his views. Of the six cases of symmetrical necrosis herein recorded decapsulation was tried in three without effect. Further, the condition is not always associated with stillbirth; one of our cases was delivered of live twins. The writer of the review points out that the operation is useless and contra-indicated for adults suffering from chronic interstitial nephritis. In two of our cases of suppression

[2] Journ. of Path. and Bact., vol. xix., 1915.

[3] Medical Science: Abstracts and Reviews, vol. ii., No. 1, April, 1920.

chronic nephritis was the only condition found post mortem, and in three others of the series symmetrical cortical necrosis was superimposed upon chronic lesions. If the presence of chronic nephritis contra-indicates such operative interference, then the differential diagnosis of suppression due to chronic nephritis and that due to symmetrical necrosis might cause some difficulty. The reviewer urges operation as soon as anuria sets in, but he does not state how long we should wait before concluding that it existed. In Case 9 of our series the suppression of urine had only lasted 1½–2 days, yet the changes found post mortem were such as to be beyond hope of any good resulting from operative treatment at that stage.

We look upon the symmetrical necrosis of the kidneys as being dependent upon the toxæmia of pregnancy and one of the manifestations of eclampsia. The writer of the review, already quoted, urges bilateral decapsulation of the kidneys on the first onset of eclampsia as offering the best chance for both mother and child, and advises delivery by Cæsarean section if the eclampsia be well established. We doubt if many obstetricians will endorse these views. We think that successful treatment will depend upon the earlier recognition of the toxæmic state and the application of such remedies as will eliminate or counteract the toxin before it has caused necrosis of the tissues or vascular thrombosis.

HÆMORRHAGE FOLLOWING THE OPERATIVE TREATMENT OF INTERNAL HÆMORRHOIDS,

WITH PARTICULAR REFERENCE TO SEVERE SECONDARY HÆMORRHAGE.

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THIS paper is based on an analysis of 500 cases of internal hæmorrhoids operated on at St. Mark's Hospital in the course of the last 16 months. In the table which follows it will be seen that ligature has been performed in 470 cases, including 62 cases in which ligature was combined with treatment for a fissure or fistula. The clamp and cautery method accounted for 18, and Whitehead's operation for 12 cases.

Table of Cases.

Nature of operation and No. of cases.		Variety of hæmorrhage, No. of cases, and No. of days after operation.	
Ligature	408	Intermediate ...	2
		Secondary-severe	5 (7, 7, 7, 7, 8)
		Secondary-slight	6 (4, 5, 6, 7, 7, 8)
Clamp and cautery ...	18	Secondary-slight	1 (7)
Whitehead's operation	12	Intermediate ...	1
Hds. and fissure (lig. and incision)	36	Secondary-slight	1 (10)
Hds. and fistula (lig. and laid open)	26	Nil.	

Post-operative hæmorrhage may be either (1) intermediate—i.e., within 24 hours of the operation; or (2) secondary—i.e., later than 24 hours after operation.

Intermediate Hæmorrhage.

Of the 3 cases of intermediate hæmorrhage requiring treatment, 2 followed a ligature and 1 a Whitehead's operation. This variety of hæmorrhage is caused by the slipping of a ligature, or by persistent bleeding from a small vessel not ligated at the time of operation or in which the thrombus has become loosened as the result of coughing, vomiting, or straining at micturition. In each case there was considerable oozing during the night following operation, necessitating one or more changes of the outer dressing, requiring active treatment in the morning. Hypodermic injections of morphia were given with general treatment, and the bleeding was controlled efficiently in each case by plugging the rectum by the methods later to be described; a vulcanite tube was inserted in 2 cases, the third was plugged with a rubber tube and a wool "surround." The tubes were removed after 24 hours, and no further bleeding occurred. The routine injection of 5 oz. of sterile olive oil was given into the rectum on the second evening after operation, and castor oil 1 oz. was administered orally on the third morning.

The operative technique is the most important factor in the avoidance of intermediate hæmorrhage. In the ligature operation in particular, care should be taken to keep the scissors accurately in the submucous plane in order to avoid dividing vessels unnecessarily; the distal portions of the ligated piles may be left in situ, or, if part is cut away, an ample amount should be left to ensure that no slipping of the ligature can take place.

No example of intermediate hæmorrhage occurred among the 18 cases treated by the clamp and cautery method.

Secondary Hæmorrhage and Its Causation.

This is an uncommon complication which cannot be anticipated, and unless the possibility of its occurrence is kept in mind, a large concealed hæmorrhage may occur before the condition is recognised. In this series 5 cases of serious secondary hæmorrhage followed a ligature operation, 4 on the seventh and 1 on the eighth day after operation. In addition there were 8 other cases of slight secondary hæmorrhage after defæcation, of no special consequence and requiring very little treatment; 7 of these followed a ligature operation.

A secondary hæmorrhage is brought about by premature separation of the sloughing pile. After the ligature operation the ligatures separate normally between 8 and 12 days after operation. In this series the average date of the secondary hæmorrhage has been seven days after operation. The chief factors in the causation of the hæmorrhage are: (1) Infection, (2) trauma, (3) anæmia and general debility. To these may be added, rarely, (4) blood diseases such as hæmophilia.

1. *Infection.*—This is the most common general cause of secondary hæmorrhage. In the operative technique employed at this hospital every care is taken to render the operation as aseptic as possible. The patient is admitted two days beforehand and efficiently prepared; just before operation the rectum is thoroughly swabbed out with ether soap and lysol, and the piles are swabbed with biniodide in spirit. The bowels are opened on the third day after operation, by which time the raw surfaces should be well covered by granulation tissue. One case of secondary hæmorrhage had a post-operative pyrexia of 101° F., which fell by lysis to normal on the sixth day, and a secondary hæmorrhage occurred on the following day. A post-operative rise of temperature to 99° or 100° F. for a day or two is not unusual, but I do not believe that this pyrexia is necessarily a sign of infection. In none of the cases of secondary hæmorrhage was there evidence of any extraordinary infection, and the cases all healed well, with no ulceration, constriction, fistula, or other sequela. A combination of unusual activity of saprophytic bacteria with diminished resistance on the part of the patient would account for a too early separation of the pile. There might be also a local infective arteritis proximal to the ligature without any actual spreading infection. A slight trauma, such as by the passage even of a soft stool, would then be sufficient to start a hæmorrhage. No case of secondary hæmorrhage occurred among the 26 cases of hæmorrhoids and fistulæ operated on. There was one slight hæmorrhage on the tenth day among the 36 cases of hæmorrhoids and fissures.

2. *Trauma.*—The important exciting cause of secondary hæmorrhage is trauma, usually caused by defæcation. To avoid constipation after operation most cases are put on liquid paraffin with aperients p.r.n., but much difficulty is sometimes experienced in keeping the bowels open satisfactorily. In Case 1 constipation was undoubtedly the important factor in the causation of the hæmorrhage, and in the other cases, although the patients were not constipated, the hæmorrhage was usually first noticed at or shortly after defæcation. Traumatism may also occur from an accidental pull on the ligatures, the ends of which are left long, but I have met with no example of this.

3. *Anæmia and general debility.*—In one of these cases (Case 2) the patient had suffered from severe recurrent bleeding at stool for several months previous to operation, and was evidently in an advanced stage of secondary anæmia. At the operation three large, pale, and friable internal hæmorrhoids were ligatured; a severe secondary hæmorrhage occurred seven days later. In a debilitated individual an avascular pile tends to slough through more rapidly than is normal, there being diminished resistance to bacterial action. It is probably safer to treat such a case by the clamp and cautery method if otherwise suitable.

4. *Blood diseases.*—It is recognised that operations for hæmorrhoids are particularly dangerous in cases of hæmophilia, intractable bleeding taking place at operation and recurring afterwards. There was no suspicion of this disease in any of these cases.

Symptoms and Signs.

There were no premonitory symptoms in these five cases of severe secondary hæmorrhage. The relation of defæcation to the hæmorrhage varied, but usually the bleeding first occurred at or immediately following defæcation. The only local sign was usually a slight intermittent or continuous trickling of blood from the anus, giving absolutely no indication as to the size of the hæmorrhage concealed. In one case a constant tenesmus was complained of, the patient straining down and passing fluid and clotted blood at short intervals. Local pain was usually present, possibly caused by the tension of blood in the rectum, the sphincter being always tightly contracted.

Each case presented to a varying degree the general evidences of loss of blood.

Diagnosis.

If a patient passes a small amount of blood with a stool, he should be confined to bed until the next stool and watched. If there is a small, continuous oozing of blood from the rectum, or a slight recurring hæmorrhage at stool, or the least suspicion of any of the recognised symptoms of hæmorrhage, the insertion of a speculum will infallibly demonstrate whether or not there is bleeding into the rectum with retention.

A Kelly speculum is sterilised, and after lubrication with sterile vaseline is passed gently into the rectum; on withdrawal of the obturator a concealed secondary hæmorrhage, if present, is at once made apparent. A finger passed into the rectum gives no information of any value, and the passage of a small drainage-tube for diagnostic purposes is not to be recommended, since it is liable to be obstructed with blood-clot. The tubular speculum affords the most certain diagnosis.

Treatment.

Local treatment.—The patient lies in the left lateral position and a tubular speculum is then introduced; a varying amount of fluid and coagulated blood will be evacuated. The presence of the speculum may excite expulsive efforts on the part of the patient; in one of these cases the patient suddenly strained down and shot out a large amount of blood when the speculum was passed into the rectum. The lower rectum should be irrigated with one or two pints of normal saline or lysol solution at 110° F. A light is then directed into the speculum, and an attempt is made to localise the bleeding vessel. The sloughs resulting from the operation are usually still present, and, together with the ligatures and entangled blood clot, make identification of the vessel very difficult. The bleeding was definitely arterial in each of the cases of large hæmorrhage, but in only one instance was I able to find the bleeding point; this patient was anæsthetised and the vessel ligated. The remaining four cases were treated by plugging the rectum; this proved quite efficient and should, I think, be successful in all cases; it is easier and quicker than ligation of the vessel, which has to be done under general anæsthesia and is rarely practicable.

Plugging the rectum.—This may be carried out by means of a vulcanite or a rubber tube; an anæsthetic is not required. The vulcanite tube (Gowlland's tube) is strong and smooth, 1 in. in diameter and 4 in. long; the end which is passed into the rectum is rounded off, the other end is screwed into an oval vulcanite plate which is pierced at opposite ends to allow of the attachment of tapes. The examination being completed, the speculum is removed. The sterilised lubricated vulcanite tube is passed into the rectum, a little dry sterile wool is packed round it at the anal margin, and it is covered by a large pad of wool secured by a T-bandage. Tapes previously attached to the tube are tied to the bandage round the waist.

Plugging the rectum with a rubber tube is, I think, more efficient, safer, and causes less pain. The method was described by Mr. Lockhart-Mummery, and the plugging is carried out in the following manner:—A piece of stout ¾-in. rubber tubing 5 in. long is boiled and dried; strips of dry sterile wool are then wrapped round it towards one end, making an oval swelling about 1¼ in. in its greatest diameter. This is smeared thickly with sterilised vaseline, and the tube with its "surround" of wool is then passed into the rectum. In cases of difficulty I have found it a useful plan first to insert a large-bore tubular speculum, and then to pass in the rubber tube with the wool surround through the speculum. A large safety-pin is passed through the tube immediately outside the anus, and a gauze strip of the requisite length is wound round the tube, between the pin and the anus, in order to effect some pressure on the pile-bearing area. The large pad of wool and the T-bandage complete the operation. This pad is inspected at short intervals to see that no further hæmorrhage is occurring, and the pulse-rate is recorded frequently.

Local treatment on these lines should control any secondary hæmorrhage from the rectum, however severe. The great merit of the tubes is that any further hæmorrhage is at once revealed, and, if necessary, the plugging can be repeated. Two cases had to be re-plugged, the bleeding being reduced but not completely stopped.

General treatment is carried out on the usual lines.

After-treatment.

The tube is usually removed after 48 hours. An injection of 5 oz. of sterile olive oil into the rectum through the tube serves to facilitate its removal and also to minimise the risk of trauma at the next defæcation. Castor oil (1 oz.) is given by the mouth 6–12 hours later, and the bowels are subsequently kept well open by means of liquid paraffin and suitable aperients. The patients are kept in bed for a week after the hæmorrhage, with treatment for anæmia.

The Five Cases of Secondary Hæmorrhage.

CASE 1.—P. S., male, aged 37. Operation June 16th, 1919. Three hæmorrhoids ligatured; post-anæsthetic vomiting for two days. Constipated in spite of large doses of par. liq. A severe secondary hæmorrhage occurred on June 24th. Speculum inserted and large amount of blood evacuated; brisk arterial bleeding from the right side. The rectum was plugged temporarily, and the vessel then ligatured under anæsthesia and a small tube left in the rectum. Pulse 112. Marked secondary anæmia. Recovery uncomplicated.

CASE 2.—A. R. B., male, aged 29, very anæmic. Operation Oct. 22nd, 1919. Three large avascular internal hæmorrhoids ligatured. Slight post-operative pyrexia; not constipated. Large secondary hæmorrhage on Oct. 29th. No definite bleeding-point seen. Rectum plugged with rubber tube and wool surround; usual general treatment. Pulse 120 Tube removed on Oct. 31st, preceded by an olive oil injection. No further bleeding.

CASE 3.—N. T., male, 36 years. Operation Nov. 27th, 1919. Three hæmorrhoids ligatured. Brisk arterial hæmorrhage on Dec. 4th. Vulcanite tube tied in at 5 P.M. The bleeding did not stop completely, so a rubber tube with a wool surround was inserted at 12.30 A.M., Dec. 5th. Usual general treatment. Pulse 96. Anæmia marked. The tube removed second day. No further bleeding.

CASE 4.—A. R. S., male, aged 44. Operation Dec. 18th, 1919. Three prolapsed and thrombosed internal hæmorrhoids ligatured. Post-operative pyrexia to 101° F., which fell by lysis, and was normal on the sixth day. Severe hæmorrhage on Dec. 25th, but no definite bleeding point seen. Controlled by plugging. Pulse 100. Tube removed second day; no further hæmorrhage occurred. No evidence of local infection.

CASE 5.—B. C., female, aged 28. Three hæmorrhoids ligatured on Feb. 16th, 1920. Secondary hæmorrhage on Feb. 23rd after defæcation. Speculum inserted and bright blood seen escaping, but no definite vessel located. Rectum plugged and usual general treatment given. Pulse 120. Slight oozing continued; rectum re-plugged in evening. No further bleeding; marked secondary anæmia. Tube removed second day.

The cases of slight secondary hæmorrhage require no further note; the bleeding occurred after defæcation on the days indicated in the table. They were treated with hazeline irrigation through a speculum, followed by the insertion of a small drainage-tube for 24 hours, with a little dry wool packing. The patients were kept in bed for four or five days, and no further trouble was experienced.

Conclusions.

1. Severe secondary hæmorrhage following a ligature operation for internal hæmorrhoids is a possible complication, occurring in this series at the rate of just over 1 per cent. of cases—5 in 470. The rectum necessarily becomes a septic area when the bowels are opened three days after operation, and it is difficult to see how the risk of a secondary hæmorrhage from sepsis can be further eliminated.

2. The average date for the hæmorrhage is seven days after operation.

3. The hæmorrhage usually follows an action of the bowels, hence in the post-operative treatment the prevention of constipation is of the greatest importance in minimising the risk of trauma.

4. The bleeding tends to be concealed, and a suspected case of hæmorrhage should be investigated without delay with a tubular speculum.

5. Plugging the rectum with a vulcanite or rubber tube is the most generally efficient method of controlling the hæmorrhage, which is to be combined with suitable general treatment.

I have to thank the surgeons of this hospital for allowing me to record these cases.

THE COMPLEMENT-FIXATION TEST IN GONORRHŒA.

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THE tests upon which this paper is based were carried out in the Pathology Department, University College, Cork. The main objects of the investigation were the determination of the diagnostic value of the reaction and its reliability as a guide to the period of infectivity. If reliable, the test will have a wide application in the diagnosis of obscure gonorrhœal lesions, especially in the female, and, employed as a criterion of cure, should prove of the utmost value in diminishing the incidence of the disease.

Theoretical Considerations.

The test under consideration has as its underlying principle the detection of specific antibodies in the serum. It would seem therefore that a strongly positive reaction signifying an efficient response on the part of the healthy tissues is of favourable prognostic import. A weakly positive or a negative reaction would seem to indicate a failure of specific antigens in reaching the healthy tissues in sufficient amount, and to suggest the administration of a suitable vaccine in order to provide the necessary tissue stimulus.

Again, a negative result in a case which had previously reacted positively, proving the disappearance of the specific antibodies, would suggest the removal of the tissue stimulus, or in other words, the destruction of the organism. In this respect, however, one must consider the possibility of the gonococcus lying dormant in some situation so walled off from the general circulation that antigenic substances no longer reach the blood-stream and healthy tissues.

To summarise, the points requiring elucidation would appear to be :—

1. Whether in all cases of gonococcal inflammation antibodies can be detected in the serum, or whether such inflammation may exist without the necessary antigenic stimulus reaching the healthy tissues. 2. Whether, when once the tissues are incited to form antibodies, such formation continues until the organisms are destroyed, or whether, the acuteness of the inflammation having subsided, the latter may lie dormant but potentially virulent without exerting any further stimulating action on the body cells. 3. A point of subsidiary importance is the approximate determination of the length of time during which antibodies persist in the serum after destruction of the organism.

The conclusions reached with regard to these points will be discussed.

Technique.

The technique employed was practically identical with that described by Captain D. Thomson, R.A.M.C.[1]

Antigen.—During the earlier stages of this investigation Parke, Davis, and Co.'s compound gonococcal antigen was exclusively employed. Later, through Captain Thomson's kindness in providing me with a supply of antigen prepared according to his own method, it was possible to compare the relative merits of the two. It was found by preliminary tests that either antigen in a dilution of 1 in 10 gave satisfactory results, and they were employed in this concentration throughout the work. The conclusions reached as a result of the comparison of the two antigens will be recorded.

Complement.—Guinea-pigs' serum which had been in contact with the clot for three to five hours was employed. The maximum complementary action seems to be attained about this time. The minimum hæmolytic dose was determined in the presence of the antigen. Thus a series of tubes was laid out, to each was added 1 volume (0·25 c.cm.) of a 1 in 10 dilution of the antigen, 1 volume of varying dilutions of the guinea-pigs' serum, from 1 in 10 to 1 in 100, and 1 volume of normal saline solution (to bring the total volume of fluid up to that present in the actual test). The tubes were then placed in the water-bath at 37° C. for one hour, and in the ice-chest for one hour. One volume of sensitised red blood corpuscles was then added, the tubes replaced in the water-bath, and the results read off in half an hour. The highest dilution of the serum which had caused complete hæmolysis was taken as the minimum hæmolytic dose.

[1] Medical Research Committee, Special Report Series, No. 19.

In all complement-fixation reactions it is advisable that the complement should be thus titrated in the presence of the antigen. It seems clear that the number of M.H.D.'s of complement absorbed by a given antigen from different sera shows variations. In the majority of cases the antigen in a suitable dilution absorbs between 1 and 1½ M.H.D., but occasionally the same concentration of the antigen will be found to absorb 2½ or even 3 M.H.D. from a given serum. This can only be due to some variation in the complement which renders it more easily absorbed or neutralised. A peculiar fact noted in this connexion is that the presence of normal human serum in the mixture containing antigen and complement diminishes the amount of the latter absorbed. Thus in reading a test it will occasionally be noted that the tubes containing the normal control serum show complete hæmolysis with 3 M.H.D. of the complement, whereas the antigen control, containing the same amount of complement but without serum, shows complete inhibition. The action of normal decomplemented serum in preventing the absorption of complement by the antigen is not easily explained.

Red blood cells.—A 6 per cent. suspension of washed sheep's corpuscles in normal saline was employed.

Hæmolytic serum.—This was obtained from Messrs. Burroughs, Wellcome, and Co., and proved very satisfactory. The usual titre was 1 in 3000 and the corpuscles were sensitised with 5 M.H.D. Thus a 1 in 300 dilution of the serum was prepared and equal parts of this and the suspension of red corpuscles were mixed and allowed to stand at room temperature for 15 to 30 minutes before use.

Patients' serum.—This was heated to 60° C. for ten minutes and then diluted 1 in 5 with normal saline.

The Test.

Four tubes were laid out for each serum and four for the controls. In the serum tubes A, B, C, D was placed 1 volume of the diluted decomplement patients' serum. To tubes A, B, and C was added 1 volume of the antigen dilution, and to tube D, which acted as the serum control, 1 volume of saline. To tubes A and D was then added 1 volume of guinea-pig's serum, containing 2½ M.H.D. of complement, to tube B, 1 volume containing 3 M.H.D., and to tube C, 1 volume containing 3½ M.H.D. The control tubes were arranged as follows :—

(1) 1 volume of normal decomplemented serum (1/5) plus 1 volume of antigen plus 2½ M.H.D. of complement	Negative control.
(2) 1 volume of a positive serum plus 1 volume of antigen plus 2½ M.H.D. of complement	Positive control.
(3) 1 volume of saline plus 1 volume of antigen plus 2½ M.H.D.	Antigen control.
(4) 3 volumes of saline	Red cell control.

The whole series was then placed in the ice-chest overnight about 16 hours. On the following morning to each tube was added 1 volume of sensitised red cells; the tubes were then replaced in the water-bath and the results read as soon as the serum controls and the antigen control showed complete hæmolysis.

The rule observed in reading the tests was that a serum showing complete inhibition of hæmolysis in the first two tubes and partial or complete inhibition in the third was marked Strongly Positive (+ + +). A serum showing complete inhibition in the first tube and partial or complete inhibition in the second was marked down Positive (+ + −). A serum showing complete inhibition in the first tube and complete hæmolysis in the others was marked Weakly Positive (+ − −). Sera which showed partial hæmolysis in the first tube and complete hæmolysis in the others was marked Doubtful (± − −), and, if possible, re-examination was carried out after an interval.

Number and Types of Cases Examined.

The total number of sera examined was 200, comprising 110 actual cases of disease and 90 controls. All collected from male patients. In the majority of the cases the subsequent history was available, and the extent to which this confirmed the results of the tests could be determined. A large number of the sera were examined simultaneously with Thomson's and Parke, Davis, and Co.'s antigen, so that the actual number of tests carried out was 298. The cases were grouped as follows :—

Group 1.—*Urethral discharge containing gonococci.*		
(*a*) Acute purulent discharge	60	cases.
(*b*) Chronic gleety discharge	20	,,
(*c*) Cases with discharge and systemic complications ...	4	,,
Group 2.—*Urethral discharge without gonococci.*		
(*a*) Gleet with a definite history of previous acute discharge containing gonococci	10	,,
(*b*) Similar cases with systemic complications	[illegible]	,,
(*c*) Cases of doubtful nature	2	,,
Group 3.—Apparently cured cases which had received treatment with ordinary autogenous vaccines ...	5	,,
Group 4.—Apparently cured cases which had not received vaccine treatment	7	,,
Group 5.—Controls, comprising cases of syphilis, non-venereal diseases, and normal individuals	90	,,

Results.

GROUP 1 (*a*).—*Acute Purulent Discharge Containing Gonococci.*

Date of collection of serum.	Total tested.	Pos.	Neg.	Doubtful
Before 12th day of discharge	9	2	6	1
Between 12th and 24th day	21	17	3	1
,, 24th ,, 50th ,, ...	30	27	2	1

In 51 cases in which the serum was collected after the 12th day of the discharge 88 per cent. of positive results were obtained.

GROUP 1 (*b*).—*Gleety Discharge Containing Gonococci.*

Date of collection of serum.	Total tested.	Pos.	Neg.	Doubtful
Between 4th and 5th week	3	2	—	1
,, 5th and 10th week	5	5	—	—
After 10th week	12	11	1	—

In 20 cases in which the serum was collected after the 4th week 95 per cent. of positive results were obtained.

GROUP 1 (*c*).—*Cases with Discharge and Systemic Complication.*

Date of collection of serum.	Total tested.	Pos.	Neg.	Complication.
5th week	1	1	—	Epididymitis.
7th ,, ...	1	1	—	,,
3rd month	1	1	—	,,
5th ,, ...	1	1	—	Arthritis.

In 4 cases with systemic complications 100 per cent. of positive results were obtained.

GROUP 2 (*a*).—*Gleety Discharge. No Gonococci. Gonococci Previously Detected.*

Date of collection of serum.	Total tested.	Pos.	Neg.	Doubtful
8th week	3	2	—	1
10th to 13th week	5	4	—	1
4th month	1	1	—	—
5th month	1	—	1	—

In 10 cases in which the serum was collected between 2nd and 5th month, 7 positive, 2 doubtful, and 1 negative result were obtained.

GROUP 2 (*b*).—*Cases Similar to Previous Group but Complicated by Arthritis.*

Date of collection of serum.	Total tested.	Pos.	Neg.	Complications
8th month	1	1	—	Arthritis.
15th week	1	1	—	,,

In two cases with arthritis and a history of gonorrhœa positive results were obtained.

GROUP 2 (*c*).—*Cases of Doubtful Nature.*

Date of collection of serum.	Total tested.	Pos.	Neg.	Remarks.
11th day	1	—	1	Mucoid discharge, denies possibility of gonorrhœa.
14th ,,	1	—	1	Purulent discharge, *B. coli* and Staph.

In two cases in which the history appeared to exclude gonorrhœa negative results were obtained.

GROUP 3.—*Apparently Cured Cases which had been Treated with Autogenous Vaccines.*

Date of collection of serum.	Total tested.	Pos.	Neg.	Doubtful
1 month after treatment had ceased	1	1	—	—
10 weeks ,, ,,	2	1	—	1
3 months ,, ,,	1	—	1	—
18 weeks ,, ,,	1	—	1	—

Three cases tested within three months of the date of last injection gave two positive and one doubtful result. Two cases tested after an interval of three months gave negative results.

GROUP 4.—*Apparently Cured Cases which had not Received Vaccine Treatment.*

Date of collection of serum.	Total tested.	Pos.	Neg.	Doubtful
Between 1 and 2 months after discharge had ceased	2	2	—	—
Between 2 and 3 months	2	1	1	—
Between 3 and 4 months	3	—	3	—

Two cases tested within two months after all symptoms had disappeared gave positive results. Five cases tested after the second month gave four negative results.

GROUP 5.—*Controls.*

Nature of case.	No.	Pos.	Neg.	Doubtful
Syphilis (Wass. pos.)	20	3	17	—
Cured syphilis (Wass. neg.)	39	1	38	—
Suspected enteric	10	—	10	—
Malaria	4	—	4	—
B. coli septicæmia	1	—	1	—
Normal individuals	16	—	15	1

Four positive results were obtained amongst 90 controls. Of these 4 cases one admitted having gonorrhœa eight years previously, but denied any recent infection. The other 3 denied ever having had gonorrhœa.

Comparative Tests with the Two Antigens.

(*a*) To determine relative degree of specificity.

Number of sera tested with both	98
Number positive with both	34
Negative with both	60
Positive with T., negative with P.D....	3
Positive with P.D., negative with T....	1

(*b*) To determine anticomplementary action.

To determine the anticomplementary action of the two antigens the M.H.D. of a guinea-pig's serum was estimated. Thus, a series of tubes was laid out; to each was added 1 volume of varying dilutions of the serum, 2 volumes of normal saline, and 1 volume of sensitised red cells. The tubes were then placed in the water-bath at 37° C. and the result read in half an hour. The highest dilution showing complete hæmolysis was taken as the M.H.D.

Two further rows of tubes were then laid out. To one row was added 1 volume of Thomson's antigen, and to the other 1 volume of Parke, Davis, and Co.'s antigen. One volume of saline was then added to each tube, and, starting at the left-hand tube in each row, 1 volume of varying dilutions of the serum. The tubes were then placed in the water-bath for one hour, and in the ice-chest for one hour. One volume of sensitised red blood cells was then added to each tube and the series replaced in the water-bath.

The result was read in half an hour, and by contrasting the M.H.D. with that determined by previous estimation the number of doses absorbed by the antigens could be determined. As a result of 15 such tests it was found that Thomson's antigen in a dilution of 1 in 10 never absorbed more than one M.H.D. On the other hand, Parke, Davis, and Co.'s antigen never absorbed less than one and a-half, and occasionally absorbed two M.H.D.

Thomson's antigen invariably proved less anti-complementary than P., D., and Co.'s. It would also appear to be slightly more sensitive, though here the difference is not very marked.

Review of Results.

As in all complement-fixation reactions the reliability of the test must depend to a great extent upon the sensitiveness of the antigen. Both antigens employed in this investigation gave satisfactory results, but more accurate information as to the serological strains of the gonococcus is desirable so that a definitely polyvalent antigen may be prepared. A negative result in the early stages of the attack is of no significance. A considerable proportion of cases during the first fortnight gave such result. The greater the duration of the discharge the greater the probability of a positive result. After the third week the great majority of cases reacted positively. The occurrence of systemic complications, such as epididymitis or arthritis, was invariably associated with a positive reaction. This is to be expected, as such complications indicate the dissemination of the organism and presumably a specific response on the part of the infected tissues.

Cases in which gonococci are found or can be induced to appear in the discharge offer no difficulty in diagnosis, and of course as long as the organism is present the patient is warned that he is infective. In many cases, however, as soon as the acuteness of the attack has subsided the organisms disappear, though a more or less scanty mucoid discharge persists. It is cases of this type which prove a serious problem for the practitioner, as he is frequently called upon to decide whether the patient is non-infective and at liberty to marry. A decision based upon negative microscopical examinations is fraught with danger, and it would seem that the complement-fixation test is of very real value in such cases. A positive result indicates either that the patient still harbours the gonococcus or that the latter has been so recently destroyed that antibodies still persist in his serum. In the latter case the positive result will disappear within a few months. The indication in such a case is to warn the patient that he is still infective, to continue local treatment, and to re-examine the serum after an interval of three months.

A negative result, especially if the serum has previously given a positive reaction, is very strong presumptive evidence of the destruction of the organism. It is, however, obvious that a much more extended investigation is necessary before the value of the test in this direction can be definitely established. Antibodies seem to disappear somewhat rapidly after the elimination of the organism. Positive results were obtained up to the third month after disappearance of all symptoms. After the third month all cases treated gave negative results.

The administration of an ordinary autogenous vaccine does not appear to prolong the positive stage to any great extent. A negative result is therefore not to be expected until three months after disappearance of symptoms and cessation of treatment, but a change from positive to negative about this time indicates complete cure and non-infectivity.

Four positive results were obtained amongst 90 controls. These positive cases were either suffering from or had suffered from syphilis. One admitted an attack of gonorrhœa eight years previously. One doubtful result was obtained in a healthy individual who had no history of gonorrhœa. It is noteworthy that the only controls giving positive results were those who admittedly had run the risk of contracting gonorrhœa, though denying any recent infection.

Conclusions.

1. The complement-fixation reaction will prove of real value both in the diagnosis of gonorrhœal infections and in the determination of the period of infectivity.

2. It is probable that with more accurate information as to the serological types of the gonococcus a more sensitive antigen will be available and still more specific results obtained.

3. Negative results are common during the first 10 or 12 days of the discharge. After this period the great majority of cases react positively. Positive results may, however, be obtained as early as the fourth day.

4. A certain number of mild cases in which the infection appeared to be limited to the anterior urethra reacted negatively through the attack.

5. The more extensive the inflammation the greater the probability of a positive result. Cases showing systemic complications invariably give such a result.

6. The complement-fixing antibody persists in the serum for about three months after destruction of the organism, during which period the reaction remains positive.

7. The administration of an autogenous gonococcal vaccine during the course of treatment does not lead to a greater persistence of antibodies, the serum becoming negative in about the same period after the final injection.

8. The criterion of cure and non-infectivity is therefore a change in the reaction from positive to negative three months after disappearance of all symptoms and cessation of all treatment.

REMOVAL OF METALLIC FOREIGN BODIES

BY SURGICAL OPERATIONS UNDER DIRECT X RAY CONTROL.[1]

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As a result of five years' experience as radiologist at the 2nd Eastern General Military Hospital, where I assisted at a large number of operations carried out under direct X ray control, I wish to appeal for the more frequent use of this method. The removal of foreign bodies is rendered easy and sure, the average time of operation is appreciably reduced, and the after-results are excellent. X ray apparatus should, however, be simple; both surgeon and anæsthetist object strongly if their work is impeded by a cumbrous or complicated X ray plant, and would prefer an X ray operating table as little different as possible from the ordinary operation table, leaving a perfectly clear field for the operation. Moreover, the day when an operating surgeon took but a perfunctory interest in the methods by which a radiologist supplies him with certain X ray data is past or is rapidly passing. The operator now often consults with the radiologist beforehand in the X ray room, using the ordinary apparatus, on the different indications of the position of a metallic fragment, and as to the steps of a projected operation. This consultation has developed into quite a rehearsal of the operation itself; therefore, to introduce a new complication in the shape of different X ray apparatus must be a mistake. For the control operations the best X ray plant is that ordinarily used, except in quite exceptional cases. However, while I maintain the superiority of the simple type of equipment, it must be an *efficient* type; it must be capable of producing perfect skiagraphs, able to show good stereoscopic views, and equal to very rapid localisation work. Many civil hospital equipments are by no means up to even this moderate standard.

Cases which have been operated on, perhaps several times over, without successful removal show such severe damage in the form of excessive scar tissue, and disability resulting from unsuccessful search, as to convince me that the common X ray help given the surgeon, by X ray plates and surface markings, is often insufficient, and that a preliminary consultation with the radiologist in the X ray room would have saved these patients much trouble. Some have been operated on by routes that surely no surgeon would have adopted had he possessed a clear and correct idea of the foreign body's exact position. Of course, it may be argued that in some cases the position of the fragment might have changed or that the position of the patient might have been different when X rayed to that when under anæsthesia at the operation. Both these contentions, to my mind, would merely be strong arguments in favour of preliminary combined observation by surgeon and radiologist.

The Essential Equipment for Direct-control Operations.

The essentials of a suitable equipment are, in my opinion: (1) Freedom from the possibility of "shocks" to patient or anyone near; (2) X ray protection for all, as thorough as can be, added to simplicity of apparatus; and (3) rapidity and ease of manipulation of apparatus. The main points of distinction in my equipment are: (1) A simple five-ply wood-topped X ray table without castors, light, and easily moved into any position, having no rails or tube-box, in fact, nothing whatever attached to it; (2) a light oak tube-stand on very easy castors; its tube-box can be moved about under the table by a handle held by the radiologist, who stands at the *same* side of the table as the surgeon, while the tube-stand itself remains on the opposite side; and (3) satisfactory X ray protection, no danger of "shocks," no liability of damage to machinery or individuals when working in the dark. It will be seen that the factors (1) and (2) give an absolutely clear field for operating.

[1] Abridged version of a paper read before the Brighton and Sussex Medico-Chirurgical Society on April 1st, 1920.

Obviously, an X ray room should be large (say, with a superficies of 500 sq. ft. and height of 12 ft.), with large windows, allowing plenty of daylight, and "through" ventilation after operations; steam radiators and electric stoves maintain a proper temperature. Walls and ceiling distempered a dull dark red allow light rays of a complementary colour to that of the fluorescent screen alone to affect the retinæ of operator and radiologist; the screen-observers can then quickly pick up the "screen-picture" when lights are turned out. Artificial light is used almost solely, but anæsthetists require that the room can be flooded with daylight and filled with fresh air at a moment's notice if necessary.

In "direct control" work the daylight and artificial lighting of the X ray room are supremely important. Blinds should fall to let daylight in and rise to shut it out. Window space must allow it to be filled with daylight when blinds are down, and blinds must be so opaque and well-fitting as to maintain absolute darkness when they are up. The darkness must be so complete that after a five-minute interval one cannot see a glimmer of light entering anywhere, nor any of the objects in the room. I prefer walls and ceiling dark red rather than black, as daylight illumination is better, and it suffices if no colour rays similar to fluorescence rays reach the retina and tire it for the screen.

For artificial lighting one powerful electric light should hang over the table for the surgeon, its exact position to be indicated by him; it should be shaded, so that no *direct* white light is on his eyes, which receive only reflected light from the patient's body and the X ray table. A weaker light beside it, also shaded, is for substitution when strong light is not needed; another weak light hangs over the anæsthetist; the other room lights are also shaded to protect the eyes of the surgeon and radiologist.

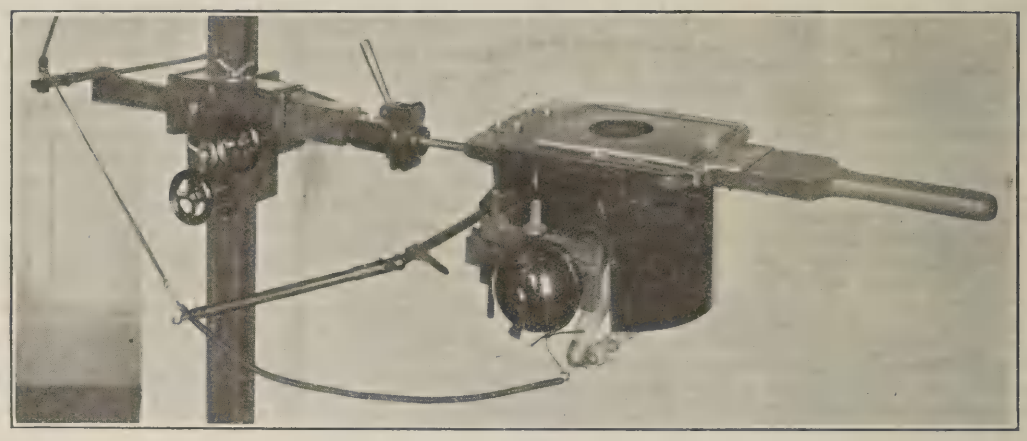
Good illumination of the operation field, if the surgeon's and radiologist's heads remain in darkness, or at least in reflected light only, does not prevent both seeing quite well all details on the screen directly lights are off and X rays started. Red-glass goggles for the surgeon have been advised, but they are not comfortable, and, in my opinion, may cause failure in asepsis.

The wooden X ray table, which must be strong, light, and steady, can be put in any position desired. The tube-stand, of oak, with heavy iron foot, on easy castors, is supplied with X ray proof box and three diaphragms. We were able to increase X ray protection by doubling the tube-box's lead-rubber lining and hanging on to the box a lead-rubber apron. A large wooden handle, hinged to fall down and giving a firm grasp, fixed to the box opposite its attached side, made the stand manipulable from the opposite side of the table. The changing of diaphragms, as supplied, occupied too much time for us, so we retained the 3-inch one for regular use and added other circular lead ones, with bevelled edges fitting in the 3-inch aperture and apertures of their own down to ½-inch; they were dropped into position or removed in a moment without danger of shifting the position of the tube-box.

The Separate Movable Tube-stand.

The separate light movable tube-stand (see figure) and light X ray table have many advantages over a heavy table with tube-box attached to it, for, besides being suitable for overhead work and emergency ward work, both table and tube-box are easily portable. Moreover, the X ray tube can be placed anywhere under the table (except on a very small area near each of two of the table legs), and, if necessary (for example, with an arm on a splint at right angles to the body), the screen examination can be carried out even beyond the limits of the table itself. Now, with a tube-box fixed on rails under a table, the combined weight is too great to move; no work outside the table is possible, while the workable area of a table is a much restricted one, and the rails and the box are often in the surgeon's way. A tube-stand need only be brought to the table when wanted, and, when unwanted, can be shifted into safety at once.

The light tube-stand has a very useful property due to its easy movement. It is difficult, sometimes, to make out a foreign body clearly, if it be deep-seated and its shadow involved in the shadow of large bone masses, or should the body be of thin metallic casing; but, if a series of very short and rapid side-to-side movements are made with the handle, then (for the reason that the parallactic movements of shadows of different structures under fluorescent-screen examination vary in amplitude in accordance with these structures' different depths) the foreign body will stand out with a distinctness much greater than if the tube be at rest.



Lateral view of tube-holder. ("Lead-rubber" apron removed.)

The light tube-stand was discovered to be more rigid and free from "vibration trouble" than our heavy iron one; but "vibration trouble" is, in my experience, usually due to the shakiness of a plank flooring. A solid parquet floor gives none; a parquet floor, correct methods of connexion of tube-box and coil, and all possible accidental earths far from the table together make shocks also impossible. For ease in tube-changing, tube-testing, centring, working with an oblique ray the separate tube-stand is incomparable.

Should the X ray evidence of his preliminary examination convince the radiologist of the necessity of a "direct control" operation, he must give his surgeon a demonstration in the X ray room. This demonstration should include exact localisation of the metal fragment in reference to skin surface and to structures near; a stereoscopic view and the section illustrations in Symington's Atlas will also help. After this the surgeon ought to have as clear a mental picture as his colleague of the foreign body's position; he can then exactly mentally visualise the sequence of his operative events and, by arranging all details in advance, save time at the actual operation.

The operative steps must, of course, vary according to the particular case, but usually bull-dog forceps mark the vertical line and horizontal plane of the metal body; the surgeon's skin-incision is at his own selected spot. The surgeon's educated sensitive finger, superior to any mechanical device, pressing the lump he feels, disturbs the fragment's shadow on the screen, and when the point of a pair of forceps are demonstrated by the method of parallax to be in contact with the foreign body, its capsule is cut into and it is removed. In the method of parallax shadows of fragment and forceps-point are made to coincide in the centre of the circle of light, and the tube-box handle is then swung to the right; if the shadows separate the left one is deeper, if they do not the two objects are touching.

Two points of value in direct control work are: (1) Easy removal of several fragments through one incision; and (2) the certainty a final inspection gives that all metal has been removed.

Certain Objections.

The objections raised are various: surgeons start off by claiming inability to see anything on the screen, but it is found that practically everyone can with ten minutes'

practice see all the details of the fluorescent-screen picture. The presbyopic men must use their glasses for near vision. Secondly, it is contended that operations with the screen are dangerous. The obvious answer is that if any X ray room is dangerous, then the radiologist is very blameworthy in not having tested its safety and remedied it, while he is the person who is by far the most likely to suffer. A third objection is that asepsis cannot be maintained. It certainly can be. The direct control cases did better than the ordinary operating theatre ones in our experience. Besides, the X ray room, with nitrogen peroxides from electric discharges always in evidence, is a spot not favourable to pathogenic germ-growth. The final argument that there is no real necessity for direct control operations is quite untenable. Five years' military hospital experience of much-operated-on patients still carrying their shell fragments unfortunately proved their necessity.

Summary.

(1) The removal of foreign bodies by preliminary mutual consultation, followed by an operation under direct X ray control has been, and will still be in the future, a necessity in certain cases. (2) A direct X ray control operation can be carried out successfully with ordinary equipment. (3) The after-results of such an operation are found to be satisfactory. (4) The practice of direct X ray control operations for the removal of metallic foreign bodies is one to be recommended in general, and especially will be required so long as cases remain who present disability due to their continued presence.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

INFECTION WITH THE ORGANISMS OF VINCENT'S ANGINA FOLLOWING MAN-BITE.

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AND
WILLIAM FLETCHER,
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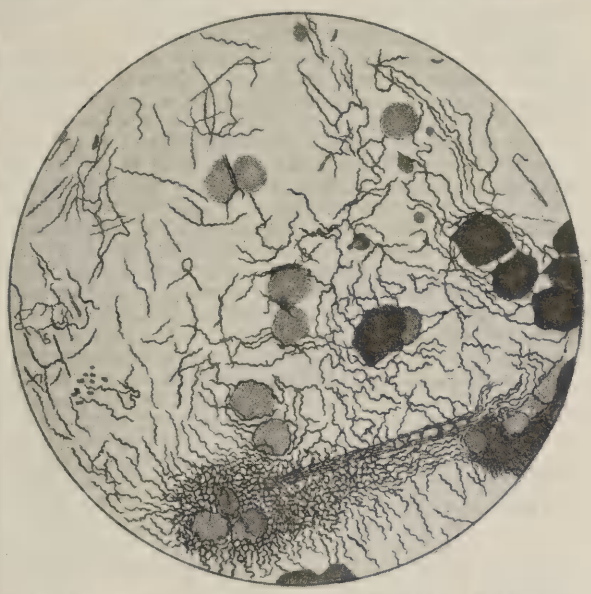
MANY years ago Babes, Plaut, Vincent, and others described a disease which usually begins as an acute stomatitis or tonsillitis, and may lead to the formation of a membrane resembling diphtheria. In the lesions they found spindle-shaped or fusiform bacilli associated with spirochætes. This disease is now known as Vincent's angina. Taylor and McKinstry,[1] who investigated its occurrence amongst soldiers, found that the characteristic lesions were always preceded by a localised, peridental, or marginal gingivitis. More recently Semple and others,[2] as the result of the examination of a large number of persons, concluded that fusiform bacilli and spirochætes are normal inhabitants of the healthy buccal cavity.

The occurrence of these organisms is not limited to the mouth and throat. Vincent found fusiform bacilli, together with spirochætes, in hospital gangrene, and in 1896, at the Académie de Médecine, he stated that they were the cause of tropical phagedæna. They have been found in noma and in erosive balanitis and vulvitis. Dick[3] has reported the presence of fusiform bacilli in three cases of meningitis in which the infection probably arose from the middle ear. Heyde,[6] in an examination of 102 cases of appendicitis, found fusiform bacilli in 8. Luger[7] has found spirochætes and fusiform bacilli in the stools. Peters[4] found them in a case of lung abscess and in another of fœtid bronchitis. Recently Blanchard[8] described a number of cases of phagedæna complicating vaccination pustules, which was due to spirochætes and fusiform bacilli.

The infection of wounds caused by the teeth has been reported by Peters.[4] In one instance a labourer injured his fingers by striking a man in the mouth. The injury was followed by intense swelling, œdema, and a foul discharge in which fusiform bacilli were discovered in association with streptococci, but without spirochætes. The same author describes the case of a bar-tender who hit a man in the mouth and injured his own hand. Despite free incisions and soaking in antiseptic lotions there was deep destruction of tissue and the hand did not heal for 54 days. In this instance great numbers of spirochætes were associated with the fusiform bacilli. Peters also mentions the case of a 7-year-old child who suffered from partial gangrene of one of her index fingers as the result of infection with spirochætes and fusiform bacilli attributed to the child's habit of biting her nails with her carious teeth.

Details of Case.

Our patient, C. P., a Tamil, was in charge of a small plantation where, one day, he caught a Malay stealing some of the rubber crop. The Malay fought savagely, bit the Tamil severely in the forearm, and then seized his left thumb between his teeth and bit it with such force that the nail was torn off and the terminal phalanx was fractured. When the patient was admitted to hospital in Kuala Lumpur a fortnight after the fight, the whole thumb was



Pus film from the patient's thumb. Stained by Fontana's method. There were very few fusiform bacilli in this film.

swollen and indurated; where the nail should have been there was only a soft mass of granulation tissue with sinuses leading down to the fractured phalanx, and at the base of the thumb there was an abscess which involved the metacarpo-phalangeal joint. The patient's temperature was slightly raised, but it fell to normal when the abscess was opened.

The pus from the sinuses contained fusiform bacilli and enormous numbers of spirochætes in writhing, tangled masses. These spirochætes were of several types and sizes. At one end of the scale there were large, actively motile organisms of the *refringens* type, which probably corresponded with Semple's[2] *Spironema buccale*, and at the other end there were very minute active spirochætes, smaller than *S. pallidum*, but with the same regular coils. Between these extremes there were two other forms which were probably the same as those described by Semple under the names of *S. medium* and *S. dentium*.

Tubes of serum agar were inoculated by introducing plugs of cotton-wool, which had been soaked in the discharge, into the bottom of the medium (as recommended by Semple), and a growth of spirochætes was obtained in mixed culture. Fusiform bacilli were also grown from the discharge by the method of Krumwiede and Pratt.[5]

Inoculations with the discharge from the thumb were made subcutaneously and into the testes of a rabbit, but it remained healthy. The experience of others has been the same; Blanchard,[9] for instance, found that the organisms of Vincent's angina do not multiply when they are inoculated under the healthy skin but only after it has been injured, as, for example, by an escharotic, such as caustic potash.

Vincent's angina does not cause a positive Wassermann reaction. In our case the patient's serum gave a slight positive reaction, but this was probably due to syphilis, for he admitted that he had suffered from a chancre ten years before.

Louis Rousseau[10] states that tropical phagedænism due to spirochætes and fusiform bacilli can be cured in about a week by three injections of 0·3 g. of novarsenobillon given on the first, fourth, and seventh

days. In our patient the thumb-joints were disorganised, the phalanges and the distal end of the metacarpal bone were necrotic; the disease had gone too far, and the pain was so severe that amputation was imperative. The patient was given two injections of 0·6 g., and after the operation he made an excellent recovery.

The main feature of this case and of that reported by Peters, is the widespread destruction of tissue (which in our patient involved the bones), resulting from an infection with spirochætes and fusiform bacilli.

References.—1. Jour. R.A.M.C., 1918, p. 512. 2. Ibid., October, 1919, 3. Jour. Inf. Dis., 1913, xii., p. 190. 4. Ibid., 1911, ix., p. 455. 5. Ibid., 1913, xii., p. 199. 6. Ztschr. f. klin. Chir., 1911, lxxvi., p. 1. 7. See Med. Science, March, 1920, p. 589. 8. Bull. Soc. Path. Exotique, 1919, p. 493. 9. Ibid., 1914, p. 96. 10. Ibid., 1919, p. 495.

A CASE OF PHOCOMELUS.

BY CAWAS HOMI, M.B., B.S. BOMBAY, M.R.C.S., ENG., L.R.C.P. LOND.

THIS type of monstrosity in mankind being comparatively rare, I think this case will be of interest to teratologists and the medical profession in general. Phocomelus is one of the sub-varieties of the monsters of the genus ectromelus (ἔκτρωμα, from ἐκτιτρώσκω, to abort or miscarry, and μέλος, a limb), a monstrosity in which the limbs are nearly or altogether deficient from an arrest of development as distinguished from spontaneous amputation. This name was given by the celebrated anatomist, Isidore Geoffroy Saint Hilaire, in 1832, who subdivided ectromelus into amelus, phocomelus, hemimelus, and ectrodactyly. The term amelus is restricted to the cases in which all the four limbs are absent, whilst the phocomelus fœtus is one in which the proximal and not the distal segment of one or more limbs is aborted, thus contrasting markedly with hemimelus, in which the distal segment is the part affected. In phocomelus the foot or hand seems to spring directly from the trunk, giving the extremity or extremities the appearance of the flippers of the seal (phoca). Ectrodactyly, a lesser degree of deformity of the genus ectromelus, shows a rudimentary hand in which the phalanges are represented by small tubercles.

Further reference to these varieties is found in Ballantyne's "Ante-Natal Pathology and Hygiene," with good illustrations and explanations. Cases of ectrodactyly are described by Dr. E. Cautley and Dr. J. D. Rolleston in the Transactions of the Royal Society of Medicine.[1]

Description of Case.

This phocomelus child was brought to the out-patient department of the Belgrave Hospital for Children for fits, and was admitted for observation, X ray examination, and photograph. He was well built,

8 days old, and showed no associated abnormality or malformation common in these monstrosities, such as umbilical, inguinal, or diaphragmatic hernia, cleft-palate, hare-lip, undescended testicle, dextrocardia or malformation of the heart, imperforate anus, spina bifida, and so forth. The umbilical cord had not yet dropped, and was black and dry. Head measured 15 inches, and its appearance suggested some internal hydrocephalus, to which I attributed the fits. The child cried vigorously.

On inquiry I found this monster was born as footling of healthy parents on March 24th, the mother having been in labour for eight hours. The period of gestation was estimated at 41 weeks, the mother having had her last menstrual period on June 10th, 1919. Father, 42 years old, is a sailor; the mother, aged 42½ years, has had three other normal healthy children (one boy and two girls, aged 16, 14, and 9 years respectively). One miscarriage in 1912 and no further pregnancy till this year. The mother attributed the child's deformity to her having seen, when about six weeks pregnant, a discharged soldier in a fit which lasted over half an hour. She saw him lying on the ground unconscious with twitching of the face, his arms adducted to his sides, forearm flexed at the elbow, and hands alternately hyperextended and flexed at the wrist. She went to his help and tried to lift him up, but she herself was feeling bad and giddy and dropped down on the floor; she was picked up and taken to her room, where she lay ill in bed for two weeks. She had a constant dread lest she might give birth to a child who might suffer from fits like the soldier, and she would wake up at night hearing and seeing a man in a fit.

For three days after the child's birth she was very excited, disliked the baby, and did not care to feed him. When four days old the child had a fit and became very blue, so the father brought him to the hospital. The child was in the hospital for a week and had fits daily, some of them severe, prolonged, and accompanied by cyanosis. The father was told that there was no hope for the child, and took him home; and death occurred during a fit when 20 days old. Unfortunately a post-mortem examination was not obtainable.

Theories of Causation.

There have been many theories propounded as to the causation of these monstrosities. In ancient times supernatural factors were invoked; some teratologists attribute them to intra-uterine conditions, such as amniotic pressure, adhesions, bands, and intra-uterine amputation, but I am inclined to believe that the chief factor in the causation of the malformation in this case was the strong maternal impression, which led to the arrest of the ontogenesis in the embryonic and neofœtal stage of existence of this child.

In conclusion, I wish to record my indebtedness to Dr. Cautley for his valuable assistance and permission to publish this case.

[1] See. Diseases of Children, vol. viii.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

A MEETING of this section of the Royal Society of Medicine was held on July 8th, Mr. J. D. MALCOLM, the retiring President, being in the chair.

Exhibition of Specimens.

Dr. J. D. BARRIS showed a specimen of Primary Carcinoma of the Fallopian Tubes in a 3-para of 53. The menopause occurred three years ago and she was well till November, 1919, when she began to have repeated hæmorrhages. When she was operated on in May, 1920, the uterus and ovaries were normal, but a columnar carcinoma was found in a Fallopian tube, which was so distended as to resemble a hydrosalpinx.

Dr. A. H. RICHARDSON showed a Fibroma of an Ovary, with warty projections, removed from a girl of 16. Its unusual feature was its warty appearance, as it was surrounded by large papillomata with fissures 1 inch to 1½ inches deep. On microscopic examination no signs of malignancy had been found.

Mr. GORDON LEY read a paper on

The Pathology of Accidental Hæmorrhage.

The first part of his paper dealt with the literature of the subject, which he reviewed at some length. He next read pathological details of the uteri removed from three cases of accidental hæmorrhage, of the kidneys of three cases, and of the liver of two cases. He had used as controls five uteri removed ante- or post-mortem for rupture or for some condition apart from accidental hæmorrhage. He found in all uteri a leucocytic infiltration, both of the decidua and of the myometrium. This was not greater in the cases of accidental hæmorrhage than in the control uteri. He also found granules of fat in the interstitial cells of the connective tissue. These also were not more numerous in the accidental hæmorrhage cases than in the control cases. He found in the cases of accidental hæmorrhage extensive albuminous œdema of the myometrium in the outer part of the wall, both of the body and of the lower uterine segment and cervix. In the control cases there was œdema only of the stretched lower uterine segment. In the cases of accidental hæmorrhage there were focal areas of degeneration, necrosis, and hæmorrhage throughout the myometrium of the body, lower uterine segment, and cervix. The distribution of these areas of necrosis was such that they could not be attributed to the

hæmorrhage. In the control cases, save for a slight vacuolar degeneration of some cells in the myometrium, there was no degeneration and necrosis, except in the stretched, œdematous, and hæmorrhagic lower uterine segment; hæmorrhage was confined entirely to the margin of ruptures and to the lower segment. He found in the liver and in the kidneys of the cases of accidental hæmorrhage parenchymatous and fatty degenerations of varying degree and extent. In one of the control cases the uterus had been suddenly stretched by an extensive intra-uterine hæmorrhage, the result of a mechanical separation of a placenta prævia, followed by the bringing down of a leg which prevented the blood from appearing externally. In this case there was neither hæmorrhage nor necrosis in the wall of the uterus. Mr. Gordon Ley concluded that the the occurrence of these phenomena in cases of accidental hæmorrhage cannot arise from the uterine distension. Other conclusions formed by Mr. Gordon Ley were that accidental hæmorrhage is the result of a toxæmia of the same nature as, and probably identical with, that causing eclampsia. This toxæmia produces the focal necroses and the hæmorrhages in the myometrium; the hæmorrhage results in separation of an area of the placenta, which in turn leads to the opening up of uterine sinuses and copious intra-uterine hæmorrhage.

Discussion.

Dr. T. W. EDEN, after congratulating Mr. Gordon Ley on his paper, said that the mechanical theory of accidental hæmorrhage could not be reconciled with the focal necroses found. The investigation threw a further light on the toxæmias of pregnancy, of which pernicious vomiting and eclampsia were accepted examples, to which accidental hæmorrhage could apparently now be added. It was curious that women with accidental hæmorrhage are not as a rule more ill.

Dr. HERBERT SPENCER also congratulated Mr. Gordon Ley, but in view of the small number of cases described considered the title of the paper somewhat ambitious. Albuminuria was not a constant symptom in accidental hæmorrhage and microscopical decidual changes were known to be variable. He thought that more evidence was necessary before the toxæmia theory could be accepted.

Dr. H. BRIGGS had collected 32 cases; albuminuria was not a constant feature, and in many cases improvement followed without treatment for toxæmia.

In reply, Mr. GORDON LEY said that in a previous paper he had described an investigation from the clinical standpoint, in which 84 per cent. of cases were associated with albuminuria, and he had received accounts from colleagues in which the lowest percentage of this association was 60. He suggested that the bulk of cases without albuminuria were probably cases of lateral placenta prævia.

Remarks by the President.

The PRESIDENT referred briefly to the death of Dr. M. Handfield-Jones, and a message of sympathy was directed to be sent to Mrs. Handfield-Jones. He then said a few words on the cancer problem, with special reference to parasitic theories, with which he was not in agreement.

The meeting closed with a vote of thanks to the retiring president.

TUBERCULOSIS SOCIETY.

A GENERAL meeting of this society was held under the presidency of Dr. DE CARLE WOODCOCK on June 26th, in the City Hall, Cardiff.

Dr. JOHN BROWNLEE (Medical Research Council) gave a résumé of his recent statistical inquiries into the epidemiology of phthisis, dwelling especially on the distribution of the disease at different ages in Wales.

Diagnosis of Early Active Tubercle.

Dr. H. A. ELLIS suggested that in a considerable number of cases it was the duty of the medical man to exclude tubercle rather than to consider its possible incidence. He admitted that this exclusion must take time and care, but in his opinion the enormous importance to the individual and to the family of the threatened persons demands time and trouble, as early recognised active tubercle almost invariably yields to treatment, with the exception of cases in young adult females. Twenty per cent. of the cases who do recover, according to Dr. Ellis, do so within six months of notification. He contended, further, that commencing activity causes autogenous absorption of the freshly-formed tuberculin, producing definite constitutional symptoms some time before lung changes could be due to active development of a tuberculous deposit. Dr. Ellis said that one of the symptoms that demand tuberculous exclusion is malaise without ascertainable cause lasting some time, and most prominent in the afternoons between 4 and 7, in contradistinction to the early morning malaise of other diseases. This malaise is more important if accompanied by loss of weight and nervous irritability and undue fatigue. Sleeplessness in the young, capricious appetite, and digestive disturbances, especially after eating uncooked cellulose, if accompanied by pain, wind, or diarrhœa, are very suspicious and always demand exclusion of T.B., likewise dislike or difficulty of assimilation of fats and fatty food. Coughs and colds, if recurrent and of increasing duration, and all forms of recurrent aphonia, laryngitis, and catarrhs, weak chests with abnormal chest signs, chronic bronchitis, pleurisy, and hæmorrhages are probably, and cold cutaneous abscesses and conjunctival phlyctenæ certainly, tuberculous. He described how he considered active tubercle should be excluded in these cases. He considered that the most important symptom when tuberculosis becomes pathological is loss of weight, and that tuberculosis rarely becomes active, and never serious, without this symptom. Tubercle can never be excluded without weighing-machines, and he advocated monthly weighing of all school children. Under normal conditions of living temperature taken in rectum always became variable or permanently elevated when tuberculosis became active; axillary temperature was useless and mouth temperature unreliable. Acceleration of the pulse was a most sensitive index; if there was no acceleration there was no active T.B. This was a negative sign, but was especially valuable after the deep inspiration practised during chest examination. Sputum was to-day insufficiently considered. More people were killed to-day by the failure to find T.B. in sputum than were saved by its discovery. It was only a negative symptom at best, as was shown in sanatoriums, since T.B. were usually present in under 60 per cent. of the patients. The character of *B. tuberculosis* was considered of great importance by Dr. Ellis. The short, straight, and unbeaded variety suggested dangerous cases with rapid extension, while the long-beaded variety suggested a slow-growing chronic case. The character of the cells was also very important. Albumin and albumose in sputum should always be tested for, as it was reliable evidence of the occurrence of T.B. in a case of bronchitis—usually a most difficult diagnosis. There must be a definite precipitate, as cloudiness does not count. No examination of sputum by itself could ever exclude tubercle. Finally, cutaneous reaction with 1 per cent. O.T. was very reliable; 95 per cent. at least of early active cases responded to this test. This was also in accord with the evidence from intracutaneous and ophthalmic reactions. If other symptoms suggested tuberculosis a 1 per cent. reaction could be considered a positive diagnosis, and where other symptoms were not in accord with the reaction active tubercle was probably present, but only as a definite menace. In conclusion, Dr. Ellis considered that active tubercle could not be excluded in cases showing malaise, nervous symptoms, afternoon fatigue, digestive disturbances, unless weight, temperature, and tuberculin 1 per cent. reaction had been tested and proved negative. Early active tuberculosis was essentially a differential diagnosis, but with these precautions it could be recognised in 95 per cent. of the cases.

The PRESIDENT then described the indications for and the means of performing artificial pneumothorax. The value of this operation in suitable cases, and particularly of massive injections of gas—Dr. Woodcock prefers oxygen—in cases of uncontrollable hæmoptysis, impressed the meeting.

Dr. PARRY MORGAN exhibited the apparatus he has introduced for performing artificial pneumothorax and explained its advantages and method of use. Interesting discussions took place on each part of the programme and the members present afterwards dined together.

On Sunday the members visited the Talgarth Sanatorium, which will be formally opened by the King and Queen to-day, July 17th. This institution, which accommodates 300 patients, stands in the centre of a large estate among the hills of Breconshire. The lay-out is that of single-storey pavilions with separate cubicles for each case. Convalescing patients supply most of the labour required for the large gardens; the original manor house of the estate is about to be converted into a post-sanatorium factory, which will at first be allocated to convalescing phthisical soldiers.

Reviews and Notices of Books.

THE MECHANISM AND GRAPHIC REGISTRATION OF THE HEART BEAT.

By THOMAS LEWIS, M.D., F.R.S., F.R.C.P., D.Sc. London: Shaw and Sons. 1920. Pp. 452 + 20. 47*s*. 6*d*. net.

NEARLY a decade ago Dr. Thomas Lewis published a book entitled "The Mechanism of the Heart Beat," intended to give a complete account of the harvest reaped, largely during the previous decade, by a host of workers—headed by the author himself—in a field of medicine made rich by the application of exact scientific methods. Much has happened since then. A second edition, under a slightly amplified title, now before us, is a work of which its author and English medicine may be justly proud. The extent of progress may be gauged from the fact that nearly half of the 800 references in the bibliography concern papers published since the first edition. There has, however, been no important alteration in the structure of the work. The original building is there, its foundations are strengthened, gaps filled in, and worthy additions made, with the result that, after many years of exact and patient application, no branch of medicine rests on a firmer basis of revealed truth than the branch concerned with the normal and abnormal mechanism of the heart beat.

The book opens with a lucid account, illustrated with colour-photographs, of the anatomy of the special tissues concerned with the origin and propagation of the cardiac rhythm. Then follow chapters devoted to an explanation of the various means by which graphic records, "imprinted by the disease itself," may be obtained and interpreted; after which we are given a detailed consideration of the several disorders of the heart met with in clinical medicine. The plan, an admirable one, is the same in nearly every case—an account of the disorder, as it is produced experimentally in animals, is followed by a description of the identical condition occurring in patients. Both conditions are illustrated with numerous tracings. In the chapters on auricular fibrillation, however, the usual order is reversed, a description of the clinical observations preceding that of the experimental proof. In this way the author is able to present the subject as it originally presented itself—namely, as a clinical problem—and to show how the solution gradually unfolded itself and how by persistent inquiry convincing evidences were at length obtained as to the true nature of this important disorder of the human heart. Nothing could be more convincing than the weight of evidence brought to bear in support of each proposition and a comparison of the animal and human tracings laid side by side. Up till now hypothesis has not had, and could not have in such a book, any consideration. But at this point there follow three most interesting and suggestive chapters in which the author allows himself, almost apologetically, not indeed to speculate, but to disclose certain general conceptions which have guided his work. He states these views with reserve, and his vision seems justified; for after discussing and discarding Mines's circus movement as a satisfactory explanation of auricular fibrillation, a slip inserted later tells us that recent and unpublished observations strongly support this hypothesis.

Since the ultimate object of all medical research must be the prevention and alleviation of disease, it seems not impertinent to inquire what debt we, as physicians, owe to this new cardiology. No better summary could be given than that of the author, when, in a vigorously worded preface, he speaks of the immediate value of graphic records to practical medicine. He says:—

"These records have placed the entire question of irregular or disordered mechanism of the human heart upon a rational basis, so giving to the worker the confidence of knowledge; they have influenced prognosis and have rendered it more exact; they have potentially abolished the promiscuous administration of cardiac poisons, and have clearly shown the lines which therapy should follow."

This is, of course, a great debt, but it cannot be forgotten that disorders of mechanism form only a part—a large part it is true—of heart disease, and that graphic records help us but little in that great group of sufferers whose cardiac mechanism is apparently normal but inefficient. Much, indeed, remains to be accomplished before the clinical study of heart disease as a whole can be looked upon as an exact science. It may be doubted whether we shall get much further help from animal experiments, and it is probable that a more intensive study of heart disease in all its forms in the human being will give us the knowledge of which we are in urgent need. Dr. Lewis has himself shown us in "The Soldier's Heart and the Effort Syndrome" what can be achieved by such study, and it is greatly to be hoped that in years to come he will have more to offer on the purely clinical side of this subject.

Little, perhaps, can be hoped for in the direction of immediate treatment. We can, indeed, rest an exhausted heart; we can exercise it when it is flabby; we can shield the helpless ventricle from the necessity of answering the foolish calls sent to it by a fibrillating auricle. But it seems clear that as we can never expect to replace a damaged muscle, our chief energy must be directed towards the prevention and better treatment of those affections which bequeath heart disease as their legacy. We look to the bacteriologists to find the cause and perhaps a specific cure for rheumatic fever; there is hope in the earlier and more efficient treatment of syphilis which is now possible; while there is yet much to be done in the investigation of those insidious and progressive degenerations of the cardiovascular system which spoil and shorten so many active lives. With regard to diagnosis, however, progress seems more likely. The conception of the "effort syndrome" has rendered necessary a closer investigation and more exact analysis of symptoms—the differentiation especially of those pathognomonic of heart disease, and an explanation of their mode of production. A difficult study this, for, being subjective, it will require of its workers a training in accuracy and method at least equal to that of the laboratory worker. Physical signs, again, want overhauling in the light of modern knowledge, with a clearer indication of those which are undoubted evidence of disease. Some of them have already been put to the test, and have emerged battered and dishevelled from the ordeal. We have less confidence than formerly in our estimation of the size of a heart by percussion, and systolic murmurs have been robbed of the significance they were long thought to possess. It is at least possible that many other of our traditional signs and methods have no other foundation than that "craving and veneration for hypothesis" against which the author of the book under review protests. With regard to prognosis we require more facts and less speculation. Here the general practitioner can help medicine in a very practical way by careful records of after-histories, and Dr. Lewis has elsewhere pointed out that the Ministry of Pensions is becoming possessed of a mass of valuable information under this heading which can be made good use of in the future.

The harvest, then, is not yet gathered and we are far from the gleaning. But to the workers necessary to complete our store of knowledge many should be added by the inspiration derived from reading this book.

PASTEUR: THE HISTORY OF A MIND.

By EMILE DUCLAUX. Translated by E. F. SMITH and F. HEDGES. London and Philadelphia: W. B. Saunders Company. 1920. Pp. 363. 21*s*.

Duclaux was born in 1840 and first came into contact with Pasteur, 18 years his senior, at the Normal School in Paris in 1859. First as pupil, later as assistant, he stayed with Pasteur for six years, then went off to professorships of chemistry and physics and did not finally settle down in Paris till 1878. In 1888 he became director of the newly founded Institut Pasteur, started the *Annales*, and was the glowing apostle of his master and of his own ideals until his death in 1904. This book was written soon after Pasteur's death in 1895, but seems to have attracted very little notice. Professor Erwin Smith came across a secondhand copy and was so impressed that he thought an English version was

worth while. It may be so, though it is likely that there will be some who differ from him. The book is, indeed, a wonderfully sympathetic account of a pilgrimage which will always be one of the landmarks of biological progress, its troubles and its retreats no less than its successes. But one wonders a little whether the Pasteur cult is not at times liable to be overdone: the study of the past is useful only in so far as it helps us to get forward to-morrow, and the position with which Pasteur had to deal is, through his own immense progress, part of a past so remote that it seems to-day unreal and disconnected from the current world. A good many, in short, will probably find the book rather dull. In the delightful American fashion, there are several portraits of Pasteur and two of Duclaux, which make one wish that there was more about the latter than the translators' 30 pages of introduction, which are the best in the volume.

THE BREAST: ITS ANOMALIES, ITS DISEASES, AND THEIR TREATMENT.

By JOHN B. DEAVER, M.D., LL.D., Sc.D., and JOSEPH MCFARLAND, M.D., Sc.D. Assisted by J. LEON HERMAN, B.S., M.D. London: William Heinemann (Medical Books). 1920. With 8 coloured plates and 227 illustrations in the text. Pp. 724. £2 net.

Dr. Deaver and his colleagues have managed in 700 odd pages to present, lucidly and exhaustively, all that is claimed by the title, and the completeness of the bibliography gives their book a value possessed by no other work on this subject in the English language. The authors have read widely and pay just tribute to their sources of information. If there is a fault it lies in the diffidence of their claims, and the avoidance of dogmatism, which we sometimes find welcome in a high authority.

The book opens with an untrammelled account of the development, histology, anatomy, and physiology of the human breast, followed by an instructive description of the congenital and acquired anomalies. The next section deals with the infections, and contains an excellent account of tuberculous breast lesions. Thoughtful consideration is given to the cystic conditions of the breast. Dr. Deaver is not one who sees in every mastitic breast a precancerous condition. He prefers, after reviewing the inflammatory and neoplastic hypotheses, to see chronic interstitial mastitis as a process of abnormal involution evidenced microscopically by both cystic and proliferative changes. Although admitting its frequent association with carcinoma, he denies the evidence and conclusions of Mr. Sampson Handley, who frankly states mastitis to be the almost universal precursor of carcinoma. Deaver is in agreement with opinion in this country when he states that the question of the malignancy of a breast tumour is seldom in doubt, and that it is unusual for the frozen section to reveal that which the gross section could not demonstrate.

After a brief but engrossing presentation of the general pathology of tumours we get a detailed clinical and pathological description of the benign tumours of the breast. Seventy pages are given to sarcoma, and the remaining 200 to the question of cancer. The evolution of the modern conception of cancer is traced, and the hypotheses of each succeeding generation are considered. A résumé is given of the more recent work upon the possibility of the sero-diagnosis of cancer. The authors discuss the meiostagmin reaction depending upon the laws of surface-tension; v. Dungern's complement-fixation test; the antitrypsin reaction of Brieger and Triebig; the various tests depending for their demonstration upon hæmolytic phenomena; and the application of Abderhalden's colour-reaction for the detection of alleged anticancerous ferments in the blood. In the latter connexion, it should be remarked that Leitch's destructive criticism of Abderhalden's claims was not then in the authors' hands. The authors refuse to lend their authority to a classification of breast cancer upon microscopical evidence alone. Their method is clinical, and they are content to recognise six varieties of cancer of the breast. The signs of breast cancer are given in detail, and their significance considered. Some pathologists would prefer to differentiate "dimpling of the skin," which is a mechanical phenomenon, from true *peau d'orange*, which has been shown by Leitch to be an actual cancerous invasion of the skin.

In a later chapter Dr. Deaver discusses the criteria which determine operability, and here the sane judgment and moderate claims mark the practised clinician. The operative treatment he regards as having originated with Charles Moore, of Middlesex Hospital, in 1867, to undergo, at the hands of Lister, Watson Cheyne, Volkmann, and Halsted, the developments which have given us our modern "en bloc" amputation. We miss a mention of Mitchell Banks's work in this connexion. Full justice is done to Handley's doctrine of permeation and its necessary corollary of perilymphatic fibrosis, and the authors state that the removals of fascia as advocated by Handley are imperative in the modern surgery of breast cancer. We gather, however, that, like Halsted, they favour the wide removal of skins, and view with suspicion the narrow skin removals to which the surgeon is tempted who follows too wholeheartedly in Handley's steps.

The book closes with a chapter from the pen of Dr. Pfähler, from which, in a footnote, Dr. Deaver appears to disassociate himself. A full account is given of the resources of the radiologist as applied to breast cancer, and if the trend appears to some to be too optimistic an acquaintance with the work which Dr. R. Knox and others are doing in London might restore their faith. We congratulate the authors upon their achievement, and most heartily recommend the book to all. For the student it is a library of knowledge, for the tutor an easy work of reference, and for the consultant a guide both for prognosis and operative treatment.

LE SYMPATHIQUE ET LES SYSTÈMES ASSOCIÉS.

Anatomie Clinique, Sémiologie, et Pathologie Générale du Système Neuro-glandulaire de la Vie Organique. By A. C. GUILLAUME. Preface by Prof. PIERRE MARIE. Paris: Masson et Cie. 1920. Pp. 160. Fr. 6.50.

Dr. Guillaume has written a particularly useful little compendium of knowledge on the sympathetic nervous system—the Land of Promise, according to Professor Pierre Marie. He rejects the terms "involuntary" (Gaskell), "autonomic" (Langley), and "vegetative" (Higier), preferring "organic neuro-glandular system" to any—since glandular and sympathetic systems are so closely interwoven as to be physiologically and pathologically inseparable. He uses the expression "parasympathetic" for the pelvic and cranial sections of the system, thus himself scarcely escaping the redundant nomenclature to which most writers on the subject seem committed. A simple, non-committal, not too detailed terminology is requisite if confusion is to be avoided. A morphological description of the system is followed by a consideration of its central representation. According to the author there is evidence that in the immediate vicinity of the motor area of the cortex are sympathetic "centres," and the dubious contention is advanced that the frontal lobes are responsible for somatic emaciation and the occipital for adiposity. The physiology of the system, sympathetic and parasympathetic, is next discussed in considerable minuteness, and various syndromes connected with irritative or destructive lesions of its different parts are sketched. Its pharmacology, too, receives due attention. Some criticism is directed to Eppinger and Hess's conceptions of sympathicotonus and vagotonus, and the latter term is replaced by neurotonus, which seems even more unsatisfactory.

The diagrams illustrating the book are unusually clear and uncomplicated, and are worth individual study. In Fig. 4 the position of the important intermedio-lateral tract does not correspond precisely to what we have learned from the authoritative work of Bruce on the subject. The arrow in Fig. 5 indicating the "Masse de Stilling-Clarke" points erroneously to the midline of the cord. In Fig. 6 "Bogiel" is an obvious slip for "Dogiel." We miss any diagrammatic representation of the central connexions of the cervical sympathetic through the formatio reticularis of the medulla.

THE NEW CHILDREN.

Talks with Dr. Maria Montessori. By SHEILA RADICE. London: Hodder and Stoughton. 1920. Pp. 170. 4*s*.

THIS is the work not of a critic, but of an enthusiastic admirer. And the Montessori methods, in theory as well as in practice, are in need of criticism, else why is there so much hostility among teachers to Montessori teaching at the present day? By criticism we mean a fair, impartial examination of the theory and of the practice by those who are competent, both in their expert scientific knowledge and in their sound understanding of child life, to analyse and to estimate values. We believe that the Montessori system of teaching will emerge vindicated and triumphant from such criticism, which, we repeat, is not to be found in this little volume. "The New Children" makes good reading for the half-initiated; it is fluent, graphic, and versatile. It touches lightly yet significantly upon many matters—for example, psycho-analysis—which are Greek to those ignorant of the subject and platitudes to the expert, while relevant to the whole problem. The author has evidently grasped the scientific truth that permeates and inspires the Montessori doctrine and has appreciated, though she may not have revealed it clearly, the relativity of the Bergsonian philosophy. And the reading public to which, on the whole, this book is likely to appeal, need enlightenment in these two directions in order to appreciate the full significance of their application to Montessori teaching. The chapters on music, suggestion, and training for citizenship attempt to justify certain phases of the Montessori system which have frequently been exposed to prejudicial criticism from those who have no acquaintance with work in the actual schools, and who forget that application of the methods by other persons in other lands may be influenced and altered by local and by personal factors. Mrs. Radice's book is an endeavour to report Dr. Montessori's own interpretation of her methods of teaching. She does not mention, however, the tendency in this country to liberate the principles governing the system from association with one personality only, and to embody them in what is now known as Auto-education.

JOURNALS.

American Journal of Ophthalmology. January–May. 1920.—We select a few articles for comment. January: H. V. Würdemann. Syphilitic Neuroretinitis. There is a coloured plate showing six examples of this condition. Out of 460 syphilitics under treatment at Camp Lewis 14 cases were found, in only 4 of which had the patient observed any diminution of vision. The severity of the cases varied very much. In no case was there a swelling comparable to cases of choked disc. The course of low grades of optic neuritis, from whatever cause, varies from a few weeks to several months, and may be followed by complete resolution, or in severe cases may leave a certain amount of greyish atrophy. The treatment is that of its cause.—A. E. Ewing. Test Objects for the Illiterate. A useful compilation of tests from various sources.—E. E. Maddox (Bournemouth). Venesection as a Preventive for Expulsive Hæmorrhage. A case of cataract in a patient of 78 suffering from myxœdema, malaria, and gout. Operation on the first eye was spoiled by an expulsive hæmorrhage. Various measures were taken to safeguard the operation on the second eye, the most important one being a free venesection immediately before the operation. The result was entirely successful.

February: Arnold Knapp. Hypotomy after Trephining. Four cases are related. The 2 mm. trephine was used in the first three and a 1½ mm. trephine in the fourth. The cases were watched for periods of from four to six years. Out of the six eyes operated on, in three there was no loss of sight or ocular change. In one the eye was lost from phthisis bulbi, and in the remaining two there was cataract. The author deems it advisable to use the smaller size trephine.—W. G. Dickinson. Ocular Manifestations in Cerebellar Syphilis. By far the larger number of cases reported have been predominated by ophthalmoplegias of the external muscles and pupillary dyscrasias. Optic nerve-changes vary from mild degrees of papillitis to well-advanced choked disc.

March: J. Van der Hoeve. Eye Lesions Produced by Light Rich in Ultra-violet Rays. The author believes that a principal cause of the origin of senile cataract is the influence of light rich in ultra-violet rays, such as daylight, which causes the opacity by interfering with the nutrition of the lens, the injury being due to damage to the ciliary processes by rays dispersed against their epithelium. In case these rays, instead of being dispersed, pass through the lens they are liable to cause senile macular degeneration. According to this theory these two conditions are mutually exclusive.—L. Weekers. Alterations in Twilight Vision in Occupational Nystagmus. The night blindness so commonly seen during the late war as a result of fatigue chiefly occurred in infantrymen who were subject to the most trying conditions during night marches. In coal miners suffering from nystagmus it is also sometimes found, and here the same two conditions account for it, fatigue and bad lighting conditions. It is an effect of fatigue in the mechanism for dark adaptation.

April: Burton Chance. Symmetric Macular Degeneration in a Brother and Sister. A coloured plate shows a good example of the condition described by Rayner Batten, Darier, and others.

May: H. V. Würdemann. The Fundus of the Eye after Death. Two coloured plates are given showing the fundus oculi respectively 30 minutes and 2 hours after death. The changes are not unlike what are found in cases of complete obstruction of the central artery of the retina during life.

The Journal of Industrial Hygiene. London: Macmillan and Co., Ltd. 3*s*. 6*d*. monthy, or 21*s*. yearly.—The subject of industrial diseases as exemplified by industrial poisons has been dealt with in several recent articles in this journal. An interesting report by Professor S. Delépine on a fatal case of arseniuretted hydrogen was published last November. The interest lies in the few recorded instances of such cases. The symptoms—jaundice with sickness, diarrhœa, and hæmoglobinuria—were typical, and arsenic was found in the liver; while the organs, particularly the kidneys and liver (the conditions of which are illustrated), showed marked degenerative changes. The rubber industry is the subject of two references. In the March issue Dr. T. M. Legge discusses the occurrence of cases (one fatal) of purpura hæmorrhagica caused by continued exposure to fumes of benzene (crystallisable benzol). The symptoms and pathological findings were those of aplastic anæmia, as exhibited occasionally by workers manipulating T.N.T. Improved ventilation, together with careful medical supervision, has put a stop to the occurrence of further cases. Messrs. N. A. Sheppard and S. Krall describe in the May number a rash due to hexamethylene-tetramine, used as an organic accelerator in vulcanisation; and, after careful consideration, propose as a remedy the application to exposed parts of a saturated solution of sodium bicarbonate. The rash starts as an erythema, quickly followed by vesicles which rupture and exude serum; it is most prevalent in hot weather, and a direct relation appears to exist between sweating and its occurrence. Exposed parts of the face, neck, and forearms are particularly affected. The remedy suggested has given valuable results.

Dr. W. Salant reviews in the June issue the pharmacology of the heavy metals, and describes special laboratory investigations into the toxicity of zinc and tin. Administration of these metals to animals was followed by symptoms of poisoning, but relatively large doses were required unless the metal was introduced directly into the circulation. The author concludes that while certain heavy metals, such as lead, are degenerative poisons, they are apparently well borne when taken with food; but he gives a warning that if the digestive mucous membrane be out of order absorption may occur and serious damage follow.

Dr. T. M. Legge, in the April number, deals with 20 years' experience of notified industrial diseases—i.e., anthrax and poisoning by lead, arsenic, mercury, and phosphorus. This résumé is one of great value; from it we see how, when once the means for preventing a disease are understood, that disease may be reduced. Lead-poisoning may be instanced; its cause is *par excellence* dust inhalation; there were 1058 cases in 1900 and only 144 in 1918. Toxic jaundice, which only became notifiable in the last three years under review, is the only other disease similarly controlled; there were 206 cases among munition workers in 1916, and only 34 in 1918. Important as these results are, and skilfully as they are presented, we are struck with the comparatively small portion of the field of industrial troubles covered by notifiable diseases; and feel that the health of the industrial worker cannot be left to wait for improvement from procedure on these lines. Investigation into only 265 cases of all kinds in 1918 among some eight million workers is hardly a convincing effort on the part of those responsible for factory supervision.

A further article on diseases for which workmen's compensation is payable, by the same author, in the May number gives support to this view. Here are reported as occurring among the miners, who number about one million, some 5500 cases of nystagmus, beat-hand, beat-knee, and the like, which are not notified or medically investigated. Dr. Legge sets out in clear and easily understandable terms the principles underlying, and the somewhat complicated procedure of, the Compensation Acts, and also describes action taken in South Africa and New Zealand with regard to fibroid phthisis. This article is one of great value to every practitioner working in an industrial area.

THE BRITISH MEDICAL ASSOCIATION.

EIGHTY-EIGHTH ANNUAL MEETING AT CAMBRIDGE.

SECTION OF SURGERY.

WEDNESDAY, JUNE 30TH.

Gastric Ulcer.

THE discussion on Gastric Ulcer on June 30th was opened by Sir BERKELEY MOYNIHAN. The burden of his message was a strong plea for the practice of partial gastrectomy as the operation of choice in the treatment of gastric ulcer, and he supported his view with impressive statistics of his results. He claimed that the technique of operative treatment was now simple and perfect, and that good results had been rendered almost certain. Surgery had, indeed, now risen beyond mere technique. It should be the surgeon's aim to discover if possible the primary source of the condition which produced the ulcer and to rectify this. Often the source was to be found in the abdomen; in other cases it lay in the teeth or the air sinuses, and it was therefore important to make an exhaustive examination of the buccal cavity and its surroundings. Operative treatment was a confession that medical treatment had failed, and often such medical treatment as was practised, especially in hospital out-patient departments, was from the beginning doomed to fail. Close supervision for months was necessary if so large an area as a gastric ulcer was to heal, and it was always necessary to treat the poor condition of the patient by rest in bed, with alkalies by the mouth, and sometimes by the transfusion of blood. Starvation treatment he believed to be radically wrong, and preferred to give as much fluid by the mouth as could be taken.

Gastro-enterostomy, first done by Wolfler on Sept. 27th, 1889, was still the favourite operation, and no operation in surgery was followed by swifter or more striking results. Surgical enthusiasms were very contagious things, and soon the operation came to be practised in cases in which there was no obstructive element; failures resulted, and for these there were several reasons, such as that the anterior operation was done instead of the posterior, that the opening was too small, that the gut had been rotated, and various other technical faults. Also there had been bad choice of cases. Sir Berkeley Moynihan emphasised the fact that gastric ulcer was a relatively rare condition. Operations had been done on the strength of a symptomatic diagnosis, and he had in many instances undone a gastro-enterostomy where the real source of the trouble was found to be an appendix abscess, an empyema of the antrum, cholelithiasis, tabes, or even the vomiting of pregnancy.

Cases of gastro-enterostomy could be roughly divided into three categories: 1. Those in which results were excellent. In these the ulcer was near the pylorus and perhaps had healed, so that there was a partial obstruction, or spasm of the pyloric end of the stomach. 2. Those in which results were poor; very many of these were attended by a non-healing ulcer of the jejunum after the operation. 3. Those in which a carcinoma eventually developed, presumably arising in the base of an originally non-malignant ulcer. No agreement was yet possible as to whether or no carcinoma really did develop in the base of a simple ulcer, but the clinical histories of cases, pathological investigations, and the histological examination of excised ulcers all tended to show that this did actually occur. Gastro-enterostomy had now, as an operation, ceased to satisfy modern expectations. Nevertheless, many surgeons still relied upon it, and he himself parted with it with reluctance. It had served him well. He had had no death in the last 400 cases in which he had practised it, and he felt towards it no menace in his heart.

Sir Berkeley Moynihan mentioned briefly the various modifications of the operation that were practised, and drew attention to the value of occasionally performing a jejunostomy in addition to gastro-enterostomy. It was noticeable that gastric and duodenal ulcers affected quite different types of stomach. The gastric ulcer was found in atonic, lazy stomachs; the duodenal was associated with the strong stomach, and often occurred in young men and athletes. Gastric ulcer was at once a rare and a serious disease, and he had found a mortality of 17½ per cent. occurring in the three years following operation, which was in itself a condemnation of gastro-enterostomy. He had found, on the other hand, that a partial gastrectomy was actually a safer operation, with a mortality of only 2½ per cent. Patients who had undergone it ceased absolutely to be patients. They never came back with recurrent symptoms, or, indeed, with anything at all, except a heart full of gratitude. Sir Berkeley Moynihan laid down with great emphasis that it was the little things that counted in the achieving of success. Care was the keynote—care in the preliminary examination, in preparing for the operation, and during the operation. Speed was also important, but could only be attained by long practice; it should be the child of experience and not the parent of disaster.

Sir Berkeley Moynihan then gave some striking statistics to show the relative mortality of the allied conditions—gastric ulcer, 2·9 per cent.; duodenal ulcer, 0·5 per cent.; jejunal ulcer, 7 per cent. This very serious complication with jejunal ulcer was a strong argument in favour of partial gastrectomy as against gastro-enterostomy. He did not, however, claim that finality had been reached in this operation. He was not yet satisfied, for happiness depended upon the existence of unsatisfied, but still attainable, desires. He concluded with a technical point—that it is unnecessary to use silk or thread in these operations. It was perfectly safe, and far better, to use nothing but the finest catgut.

Dr. CHARLES H. MAYO (Rochester, Minn.), who next addressed the meeting, received a great ovation; he modestly disclaimed this on his own account, but accepted it as the representative of the medical profession of the United States. Dr. Mayo did not attempt to refute any of Sir Berkeley Moynihan's contentions, but contributed a learned and weighty review of the subject under discussion. He gave statistics to show that gastric ulcer was a relatively rare disease and that the ulcer was nearly always single. In discussing the ætiology of gastric ulcer he put forward the theory that the ulcer is produced by an association of local chemical effects, with a direct interference with circulation by infarction emboli of bacteria. Characteristic bacteria could be grown from an excised ulcer, and an injection of these into animals produced a high percentage of similar ulcers. The chronicity of the disease was to be explained by the chemistry of the bacterial products. Medical treatment, the coördination of which was chiefly due to Dr. Sippey of Chicago, was directed towards the control of acidity in the stomach by dilution and neutralisation, but such treatment produced only temporary results and could not always be obtained. During the long periods of treatment which are necessary urgent conditions, such as perforations, may arise which demand surgical treatment, and not a few cases develop cancer, resulting in death. In the past surgery had sometimes earned discredit through the performance of gastro-enterostomy on the basis of a mistaken diagnosis, and in the Mayo Clinic a few hundred such operations had had to be undone.

Dr. Mayo laid stress in making a diagnosis on the clinical and dietetic history. He distinguished between qualitative and quantitative food-dyspepsia, the former being usually not due to an ulcer. Hæmorrhage was not a symptom of importance in most cases. He placed great reliance on X rays in diagnosis, a correct diagnosis being arrived at by this means in 95 per cent. of cases; it was particularly valuable in helping to distinguish between gastric and duodenal ulcer. He agreed with Mr. Herbert Paterson that after gastro-enterostomy had been performed the alkaline secretions of the duodenum tended to reduce the acidity in the stomach, and that this change in local environment encouraged healing of the ulcer. At the Mayo Clinic the mortality after operation for gastric ulcer was nearly double that for duodenal ulcer. Various statistics were given of the position, age- and sex-incidence of gastric ulcer. Investigations that had been carried out led Dr. Mayo to reiterate that gastric ulcer is potentially malignant.

In discussing the various operations that could be performed the anterior route of approach and anterior anastomosis were favoured. Gastro-jejunal ulcer was believed to be due to the use of permanent suture material and to the presence of chronic foci of streptococcal infection. Dr. Mayo stated, in conclusion, that surgical treatment was the best recognition of the value of medical treatment by permanently overcoming obstruction and by lowering acidity with the patient's own alkalies.

Mr. HERBERT PATERSON (London) made a strong plea for clear-thinking concerning the indications for operation and its results. In this connexion he accused Sir Berkeley Moynihan of an admirable inconsistency between his scepticism as to there being any physiological factor in the results of gastro-enterostomy and some of his other statements. He was never afraid to

change his attitude, but the change was made in so graceful and facile a manner that it was hardly noticed even by his friends. Mr. Paterson believed firmly himself in the reduction of acidity after operation by the entry into the stomach of alkaline duodenal juices. After undoing a gastro-enterostomy there was a return to the previous degree of acidity, whereas a decreased acidity does not accompany the operation if an entero-anastomosis be done at the same time. Concerning the development of cancer in a gastric ulcer, he considered that there was no clinical evidence for it, and that the pathological evidence was unconvincing.

Mr. A. H. BURGESS (Manchester) believed that too much was expected of gastro-enterostomy. Its object was twofold—to get rid of the ulcer and to get rid of hyperacidity. The best results were obtained from a combination of excision and gastro-enterostomy. But excision was often very difficult, and, consequently, the best routine operation was a partial gastrectomy. This was not to be done when the ulcer was very high in the lesser curvature and when it was too extensive. In these cases gastro-enterostomy with jejunostomy was the best treatment. The physiological effect of the operation he considered to be proved. He discussed whether the edges of the opening in the transverse mesocolon should be attached along the line of anastomosis or at a distance, and favoured the second alternative, having seen a constricting scar formed within 12 days of the operation. He emphasised the importance of giving alkalies in after-treatment.

Mr. CHARLES RYALL (London) regarded a gastric ulcer as a simple inflammatory process with a predisposing cause in hyperacidity and an undetermined exciting cause. Ulcers do heal, and a gastro-enterostomy had been proved to provide a physiological rest. No fixed operation should be used, and excision should not be done in every case. He believed that an exaggerated importance had been given to the development of carcinoma in an ulcer.

Professor J. M. T. FINNEY (Baltimore) stated that in practice he had found it hard to diagnose the presence of a gastric ulcer even with the abdomen open before him. Sometimes there was no response to treatment, and he had failed often enough to be sceptical of any rule. Speaking on behalf of "the common barnyard surgeon" he considered that every case should be treated on its merits. He advocated pyloroplasty owing to the opportunities it gave for making a thorough examination of the stomach. The group for which resection was suitable was ever widening. He had had no mortality yet, but it was bound to come, and he was therefore sorry for every patient upon whom he operated.

Mr. W. BILLINGTON (Birmingham) was still seeking for a satisfactory explanation of the symptoms. He discussed the way in which the site of the ulcer influenced the success of the operation, and believed that excision alone was a bad operation. He was shaken in his belief in the physiological effect of gastro-enterostomy, as he had obtained better results by combining it with a jejuno-jejunostomy, so that alkaline fluids were prevented from reaching the stomach. Every ulcer in the body of the stomach he treated as an hour-glass stomach by making a double opening, and had obtained good results in 50 cases.

Mr. R. P. ROWLANDS (London) dwelt on the uncertainties of diagnosis, and on the necessity for examining the whole abdomen at operations. Gastro-enterostomy was like magic and should be used with caution. He insisted that it was perilous to advocate the extended use of so difficult an operation as partial gastrectomy by the general surgeon.

After a few remarks from Sir GEORGE MAKINS,

Sir BERKELEY MOYNIHAN made a short reply to his critics. He defended his scepticism concerning the hydrochloric-acid findings, which in any case were below normal in a large number of *proved* gastric ulcers, and he gloried in his inconsistency. The operative mortality from gastro-enterostomy, which was often followed by a fatal carcinoma, was equal to that following gastrectomy, which cured all patients for ever. Mr. Paterson, he said, had long been a devout worshipper at the shrine of the goddess Hyperchlorhydria, and he described him in the following lines from Shakespeare's sonnets:—

> O, know, sweet love, I always write of you,
> And you and love are still my argument;
> So all my best is dressing old words new,
> Spending again what is already spent.

Mr. FRANK KIDD (London) opened the second discussion on

The Treatment of Calculi in the Pelvic Part of the Ureter.

Stones in the ureter, he said, were usually single. There were several stages in the effects following the presence of a stone. Fibrosis gradually developed in the tissues of the pelvic wall surrounding the stone; then the ureter above the stone became dilated, bacterial infection arrived by the blood-stream or lymphatics, and a pyonephrosis resulted. Sometimes, however, the calculus was silent for years, and then gave rise to symptoms resembling renal colic. An accurate diagnosis was absolutely essential, and for this X rays should be used. There were fallacies in the shadows produced by various other opaque bodies in the pelvis, and an opaque ureteric bougie or the injection of 20 per cent. colloidal silver must always be used to confirm the X ray diagnosis before any operation was done.

He considered that in treatment no operation was necessary in the majority of cases. A chance should always be given for the natural passage of the stone, as there was no time-limit for this; the ureter was rarely completely blocked, and the kidney was often able to recover after prolonged partial blockage. An operation, however, should be done in cases that were infected, when the stone was bilateral, where there was calculus anuria, or when there was long-established and fixed pain. In many cases an operating cystoscope could be used. A natural passage of the stone could be encouraged by the injection of parolein round the stone, or incision and dilatation of the mouth of the ureter could be practised, followed by extraction of the stone with forceps. In operating an inguinal or mid-line incision could be used. He himself usually employed the inguinal route, reserving the middle-line incision for bilateral stones or for cases of unusual difficulty. Sometimes stones moved in a dilated ureter, and an X ray photograph should always be taken just before the operation. For purposes of diagnosis it was essential to detect blood microscopically in the urine. Mr. Kidd's main contention was for conservative methods in treatment.

Mr. SWIFT JOLY (London) disagreed with Mr. Kidd on his chief points. He preferred the median incision in most cases, and considered that operation was usually the most satisfactory method of treatment. This was determined in many cases by the size of the stone, since only those that were smaller than orange-pips could be readily dislodged by injections of the ureter and similar methods. It was also helpful to take X ray photographs after successive attacks of colic, and so determine whether the stone showed any tendency towards moving or not.

Mr. GREY TURNER (Newcastle-on-Tyne) was against the performance of an operation if the stone was small. An examination of the patient per vaginam or per rectum was often helpful, though sometimes omitted.

Mr. ROWLANDS had removed a number of ureteral calculi which, though large, were not opaque to X rays. He regarded cystoscopy, combined with an indigo-carmine injection, as a useful method of confirming a diagnosis of obstructed ureter. He was opposed to exposing the kidney to the risk of destruction for so long a time as was advocated by Mr. Kidd.

Sir HAMILTON BALLANCE (Norwich) and Dr. MAYO also contributed some remarks to the discussion.

THURSDAY, JULY 1ST.

Carcinoma of the Rectum.

The discussion on July 1st on the Treatment of Carcinoma of the Rectum was opened by Mr. ERNEST MILES (London), who appeared as the advocate of his abdomino-perineal method of resection of the lower bowel. He contended that all operations must be founded on the pathological findings, and that removal of any growth must include the whole of the tissues affected by the disease. Carcinoma of the rectum spread by

three methods—by direct extension, by the venous, and by the lymphatic channels. Of these the extra-mural lymphatic channels were by far the most important, and he illustrated by diagrams, which were based on his own investigations, the various routes, disposed in three zones, by which cancer cells might reach the lymphatic glands situated at the bifurcation of the common iliac artery. The most vulnerable tissues were the perianal fat and the levator ani muscle, the retro-rectal glands, and the parietal attachment of the pelvic mesocolon.

Mr. Miles then reviewed the various methods of perineal resection of the rectum, and dismissed them all as inadequate. He traced the various stages by which the operation from below had been extended, but pointed out that the most radical of these left the pelvic mesocolon behind, which was still out of reach. He condemned as unsound those operations which attempted to preserve a continent anus. He arrived thus at the description of his abdomino-perineal operation, which was planned with a view to the removal of the whole of the pelvic mesocolon, "the axilla of the rectum." He admitted that his operation mortality had been at first as high as 43 per cent., but it had now fallen to 18 per cent., whereas, if the pelvic mesocolon were not removed, 100 per cent. died from recurrence of the disease. He contended that the operation was particularly suitable for early cases, but should not be done in old patients, who could not stand a severe operation. In these a colostomy or a perineal excision could be performed as a palliative.

The subsequent discussion resolved itself into a contest between those who agreed with Mr. Miles and those who were in favour of operating from below in most cases.

Mr. GREY TURNER, while agreeing with Mr. Miles as to the mode of spread of the disease, believed that as an early diagnosis came to be more frequently made, so a local removal would be more often adequate. He was unable to understand how Mr. Miles came to have 100 per cent. of failures if the pelvic mesocolon were not removed, as he was himself able to record a number of cases of apparent cure after a local operation. Nevertheless, surgical progress must not be clogged by considering operative mortality in a disease which resulted in 100 per cent. mortality if left alone. For growths high up in the rectum perineal or sacral resection would not be enough, and he would not hesitate in that case to remove the pelvic colon by the abdominal route. In considering the range of operability he was not deterred by local fixation of the growth unless the bladder were involved. Often a preliminary colostomy rendered a growth operable when it had seemed at first inoperable.

Mr. P. LOCKHART-MUMMERY (London) said he had been one of the first surgeons in this country to practise the abdomino-perineal operation. He was still performing it in special cases, but had abandoned it as a routine and was now trying to develop a technique which, while giving a free removal of the growth, would reduce the operation mortality to a reasonable level. During the present year he had had no deaths in 24 cases operated upon. The operation was usually done in two stages, the first of which was a colostomy through the left rectus muscle. The second operation for removal of the rectum was done under spinal anæsthesia a week later. The anus is first closed and the rectum then freed by dissection from in front and from the perineum upwards. The bowel is divided with the cautery between clamps and the end is invaginated. The wound is closed without drainage. The late results appeared to be quite as good as were obtained after the abdomino-perineal operation, while the immediate mortality was reduced almost to nil.

Mr. BURGESS, while convinced on logical and theoretical grounds that Mr. Miles was right, did not follow him out in practice, being deterred by the high operation mortality. He agreed that if the abdomino-perineal operation were used at all, it must not be reserved only for bad cases. The earlier the case the more extensive was the operation that was indicated.

Mr. RYALL was strongly of the opinion that no routine operation should be performed, but that every case should be considered strictly on its merits. Mr. Miles's operation he believed to be the only sound and scientific one, and he was confident that time would reduce the mortality to a low figure. He considered that an early colostomy to remove sepsis and inflammation was an exceedingly important part of the treatment.

Dr. H. H. BROWN (Ipswich) recorded several cases that were alive and well after a relatively restricted operation, and recounted an attempt to conserve the sphincteric action of the anus.

Sir GORDON WATSON (London) believed that the treatment of this disease was still far from stabilised. Even Sir Berkeley Moynihan had told him that he had changed his mind on this subject more often than on any other surgical problem. He himself had been convinced by Mr. Miles's arguments and technique in 1909, but his own results with the abdomino-perineal operation had been very discouraging. By a process of statistical reasoning he had arrived at the conclusion that the final results of Mr. Lockhart-Mummery's operation were 1 per cent. better than those of Mr. Miles, and he consequently was now reserving the abdomino-perineal operation for cases of cancer at the recto-sigmoidal junction or above it.

Dr. MAYO stated that he had no use for any routine operation. At the Mayo Clinic all the methods were employed. He pointed out that the enlarged glands in the mesocolon were often inflammatory and not carcinomatous; a rapid diagnosis with frozen sections could be made during the course of the operation and the procedure then modified accordingly. Dr. Mayo then diverged on to an interesting general consideration of the biological problems of cancer growth.

Mr. JOCELYN SWAN (London) was a convinced adherent of Mr. Miles's method. He himself had so far been lucky enough to have had no operative mortality in 11 cases.

Mr. D. P. D. WILKIE (Edinburgh) put in a strong plea for Mr. Grey Turner's view of the great importance of retaining sphincteric control if possible. He admitted that it was difficult to criticise Mr. Miles's ideal operation, but considered that its high mortality prohibited its general use. The chief dangers of the operation he believed to be shock and sepsis, particularly septic pneumonia. He therefore suggested that the patient be immunised before operation with vaccines or be protected by inducing a leucocytic reaction.

After a few remarks from Sir HAMILTON BALLANCE and Mr. HAMILTON DRUMMOND (Newcastle-on-Tyne), the two speakers who had opened the discussion made short replies. Mr. GREY TURNER reiterated his conviction that the local removal was far more important than removal of possible distant infection. Mr. MILES admitted the absolute necessity for local removal, but was convinced that the region of upward spread was of equal importance. He was in favour of performing a preliminary cæcostomy to drain the bowel, and considered that spinal anæsthesia with gas and oxygen was the best form of anæsthetic.

The Diagnosis of Glaucoma.

The second subject, the Diagnosis of Glaucoma, was introduced by Lieutenant-Colonel R. H. ELLIOT (London). He stated that the history of the subject could be divided into three stages, marked by the names of Hippocrates, Helmholtz, who introduced the ophthalmoscope, and Legrange, who in 1906 introduced the operation of sclerectomy. The condition can be arrested if a diagnosis be made early and if the treatment be rational. The methods of diagnosis which Colonel Elliot described were: (1) Observation of the pulsation of the retinal vessels; (2) the measurement of intraocular pressure by the tonometer; and (3) the accurate investigation of limitation of the field of vision by perimetry. He referred also to examination of the light sense and to corneal measurements.

There was a short discussion, in which Mr. WALLACE HENRY (Leicester) and Mr. G. E. WHERRY (Cambridge) took part.

FRIDAY, JULY 2ND.

Nerve Suture and its Results.

The discussion on Friday, July 2nd, concerning nerve suture and its results turned chiefly on the value of nerve grafts and implantation operations; the speakers

were in substantial agreement as to the technique and results of the ordinary suture operation.

The opening speech was delivered by Sir WILLIAM THORBURN, who dwelt rather on the general principles. Beginning with the accepted fact that repair depends on the downgrowth of axons from the proximal end, he pointed out that a good anatomical result depends upon the downgrowth of a sufficient number of axons into a corresponding number of sheaths. On the other hand, a good physiological result means that the right axons must have encountered those conducting sheaths which will have taken them to the right kind of end-organs—that is to say, motor nerve fibres to motor end-organs and sensory fibres to sensory end-organs. Usually, however, there was some nerve "shunting"—that is, the downgrowth of nerve fibres to end-organs other than those with which they were originally connected. Sometimes this was done intentionally, as when the proximal part of the hypoglossal nerve was sutured to the distal part of the facial. More often this took place on a histological scale, motor fibres growing down to sensory end-organs and sensory to motor. This was partly due to the difficulty of accurate coaptation of the ends, but also to the fact that the fibres of a nerve were twisted like the strands of a rope, so that any given fibre was constantly altering its relative position in the nerve. This fact rendered futile some operations, such as that of making nerve flaps, which were practised up to 1915 but had now been discarded. It was on the face of it improbable that a nerve graft should give a good physiological result, however perfect the surgical technique. A third point of view from which results had to be considered was the economic. Often the economic result was better than either the anatomical or the physiological. He had seen, for instance, a restoration of the function of the ulnar nerve which appeared economically to be complete, though there remained an anæsthesia of the area supplied by the ulnar of which the patient was unaware. Sometimes, in spite of a good anatomical and physiological result, the economic result was bad owing to the patient's mental condition. Sometimes it was bad on account of "local ataxia"—that is to say, the function seemed to be entirely restored if the patient's attention was concentrated on the part concerned, but it quite failed if the movements were attempted in the dark or when the patient's attention was occupied by something else; this failure of the automatic function was due to the imperfect recovery of some of the afferent conducting paths.

Sir William Thorburn then gave statistics of results obtained by various operators in this and other countries. Good results seemed to be obtained in one- to two-thirds of the cases; very good results were seldom obtained, but complete failures were fairly numerous. He had no faith at all in the efficacy of grafting operations, and he pointed out that some of the bolder operations, such as nerve-stretching, transference of the nerves to new beds, and tendon transplantation, did much towards rendering grafts unnecessary. It had been found that certain general principles in results usually held good: large muscle masses producing coarse movements recovered very much better than small muscle groups controlling finer movements; function nearer the trunk was more readily restored than function at a greater distance; homogeneous nerves, such as the musculo-spiral, recovered better than nerves controlling more complicated movements.

Concerning the long time taken to obtain recovery after operation, it had been estimated that downgrowth of the axon, as determined by means of Tinell's sign, proceeded at the rate of about one millimetre per day; recovery of function in the hand therefore took much longer than recovery in the upper arm. Much of the time, however, in either case was taken up in establishing connexion of the nerve fibres with the end-organs. The work that had been done at Manchester showed that a quite perfect result was never obtained, the recovery of sensation being particularly poor. The best functional results were obtained with the musculo-spiral nerve. If a surgeon obtained good economic results in 50 per cent. of his cases he was doing well; if he obtained them in 75 per cent. he was not only doing well but was exceedingly fortunate.

Mr. PERCY SARGENT (London) said that the conditions in war wounds, which introduced so many serious complications, were entirely different from those of simple experimental cases. There were two main groups of cases—the one in which operations were done for the restoration of the conduction of nervous impulses, the other in which they were done to improve disordered function. He proposed only to consider cases in which restoration of conduction was attempted by means of resection of damaged nerve tissue and suture of cut surfaces. He believed that end-to-end suture was the only means of obtaining restoration of conduction, and that other operations need scarcely be considered. In this connexion he described a case in which a lateral anastomosis of nerves was done with anatomical failure. He stated that no useful result had ever been obtained by carrying out a graft operation. In considering the results he assumed that only the best technique had been employed—that is to say, the operations had been done without deep fixation sutures, with accurate suturing of the nerve sheath; that a gap of at least 1 mm. was always left between the ends of the nerve-fibres; that no sort of wrapping had been put round the sutured nerve; and that there had been no sepsis. He made no distinction between "primary" and "secondary" suture.

What, then, were the prospects of the operations in general? In considering this question, he had come to the conclusion that "end-results"—that is to say, final results, as distinguished from "late results"—had not yet been obtained in the majority of cases. The criteria that were used in examining cases were the condition of the nerve in conduction capacity, its electrical reactions, the power of voluntary contraction, and sensibility of various kinds. The interpretation of results was often very difficult. Sometimes very misleading cases were put forward as evidence, and in illustration of this Mr. Sargent mentioned a case of nerve-grafting, which had been reported as a success, but was found on critical examination to have been erroneously described. If sensation alone was considered, too rosy an impression might be obtained. The power of voluntary movement considered by itself was apt to be misleading, owing to the education of other muscles that sometimes took place with the production of unsuspected "trick movements." If there appeared to be a return of voluntary movement in the absence of sensory recovery these trick movements must always be suspected. Results differed widely in different nerves; they were specially good in the musculo-spiral, but very much worse in complicated nerves, such as the median and the ulnar. The muscles of the forearm recovered much better than the muscles of the hand. Sometimes the sense of position was wholly absent when the results, as regards the voluntary movements and electrical reactions, were good. It was very important that sensibility should be restored, especially in the case of the median, but the motor function of the ulnar nerve was of little importance. Late results might be bad owing to coincident psychological factors. The value of re-education might be very great, but the same degree of success must not be expected in all cases, since individual capabilities varied greatly, some men being normally incapable of any but very clumsy movements. So-called "trophic changes" were often the result of neglect or immobilisation for too long a time, and could be improved by suitable treatment. A disordered vaso-motor activity was usually due to an irritative lesion and might affect the end-result, since it was accompanied by nutritional effects.

Mr. Sargent referred, in conclusion, to the condition of continuous or chronic pain, known as causalgia. Sometimes this tended slowly to abate; in other cases no treatment was of any avail, though operations should always be tried. Causalgia was often associated with very little loss of movement or sensibility, and the trophic changes associated with it could be arrested. Alcohol injections of various strengths often relieved the condition, but if it were necessary to inject concentrated alcohol a lesion of the nerve would be produced from which there would be no recovery.

Dr. MAUD FORRESTER-BROWN (Edinburgh) gave elaborate statistics derived from an examination of the results following 643 operations done in Sir Harold Stiles's clinic. Her figures illustrated many of the points mentioned in Mr. Sargent's paper. She recorded two cases which showed complete motor recovery after nerve-graft or flap operations, and stated that very good results had been obtained from tendon transplantations. Tinell's sign was obtained in most cases, but in some was entirely absent.

Mr. COPLAND (Leeds) appeared to be in agreement on most points with Mr. Sargent. He mentioned, however, some cases of nerve-grafting in which there had been positive results. In one case in which seven inches of the median nerve had been supplied by a graft there

had been some return of sensibility in the median area; in two other cases there had been some improvement of motor function. In the technique of the operation he believed that it was of great importance to make a new bed for the nerve to lie in. He pointed out that the trick movements mentioned by Mr. Sargent may be of value from the economic point of view, and should therefore be encouraged; they also produced a better blood-supply to the limb. The most rapid recovery that he had met with had been in a case of suture of the median nerve, in which recovery was complete in nine months. The use of warmth he believed to be of great importance in after-treatment.

Mr. J. L. JOYCE (Reading) said that too much stress was being laid on the operation, which was merely an episode in the treatment. The operation of choice was end-to-end suture, but among 121 cases he had found that 22 could not be treated in this way. For these 22 he had used autogenous grafts, homologous grafts, double lateral implantation, and tendon transplantation. The results obtained compared favourably with those following end-to-end suture. Double lateral implantation, or, as he preferred to call it, a pedicled autogenous graft, gave better results than a free autogenous graft. He felt encouraged to pursue his investigations further.

Mr. ROWLEY BRISTOW (London) agreed in the main with Mr. Sargent. He drew attention to the fact that those cases which showed early signs of nerve regeneration did not necessarily give better end-results than those which were more delayed. He had seen six cases of graft operations; these were all complete failures, except one, in which the signs of recovery were probably due to the muscles having acquired a connexion with other nerves. It was possible for an isolated nerve to show in this way signs of apparent recovery. Tendon transplants had given good results.

Mr. NAUGHTON DUNN (Birmingham) said he had found that, contrary to his expectation, nerves sutured under tension recovered better than when there was no tension. This emphasised the importance of Mr. Sargent's statement that there should always be a small gap between the sutured ends, and reduced the number of cases in which a graft need be attempted. He had never seen any signs of regeneration in a grafted nerve.

Dr. L. E. SHORE (Cambridge), as a physiologist, presented a point of view which was somewhat different from that of the other speakers. He said that the exact way in which the axis-cylinders grew down was obscure, but they appeared to be under a chemiotactic influence. One axis-cylinder usually divided into a bunch of fine fibrils, which then grew out in all directions and seemed to hunt for the right track to grow into; some were successful, but many of them failed to find a sheath. He described the way in which Professor Langley first showed that nerve fibres were twisted in the nerve like the strands of a rope; this fact made him look upon any attempt to obtain anatomically accurate union as quite hopeless. There appeared to be two classes of motor nerve fibres with physiologically different functions; one was controlled by the lower brain centres and moved large muscle masses, the other by the higher centres and produced the finer movements. He believed that the economic result of operations depended largely on the degree of recovery of epicritic sensibility. He finally inquired of the surgeons whether a gap in a nerve had ever been bridged by shortening the bony skeleton of the limb.

Sir WILLIAM THORBURN, in reply to Dr. Shore, stated that shortening of the limb had been done on several occasions. The operation was particularly suitable for the upper arm.

Mr. SARGENT, in conclusion, dwelt on the difficulty experienced by most surgeons of achieving absolute honesty in the interpretation of their own results, and he applied the criticism to himself as much as to anybody else. He repeated his conviction that no true recovery after a graft operation had ever been obtained.

Chronic Suppuration in the Accessory Sinuses of the Nose.

The paper by Mr. HERBERT TILLEY (London) on this subject was not of a controversial nature; it was intended rather for the instruction of those who had not thought much about the diagnosis of sinus suppuration, which was nearly always the underlying cause of a so-called chronic nasal catarrh. Mr. Tilley discussed the origin, signs, symptoms, and the treatment of sinus suppuration, and illustrated his points with anatomical drawings and diagrams. He followed up his lecture with a demonstration of the methods of endoscopy on the afternoon of the same day.

Demonstrations.

The secretaries of the section had arranged in addition to the discussions a series of very successful demonstrations in the afternoons. On June 30th a demonstration was given by Mr. P. P. COLE and Mr. H. D. GILLIES (London) of the methods and results of plastic surgery of the face. The surgery of the war wounds of the face has been fully described in Mr. Gillies's recent monograph, and is therefore widely known. The photographs and cases shown were for the most part already familiar to those who had seen the book. A more novel feature was the exhibition of several patients who had been treated by plastic surgery for conditions met with in civil practice. These included an epithelioma of the nose, lupus of the nose, excision of the lower jaw, and cleft-palate. The results obtained were a vindication of Mr. Gillies's faith in the brilliant future which lies before plastic surgery.

On two afternoons, June 30th and July 1st, Major MEURICE SINCLAIR gave a practical demonstration of the modern methods of treating fractures. He first showed the use of a Thomas's splint as first-aid treatment for a fracture of arm or leg, and then carried out in detail the whole process of putting up a patient with a fractured femur in the Sinclair net-bed. The treatment of a series of different fractures was demonstrated and was made realistic by having the splints in position on men posing as patients.

On July 1st Mr. ARTHUR COOKE and Dr. J. W. MACNEE showed how to test prospective blood donors for their blood groups and demonstrated the whole process of blood transfusion, first by means of a Kimpton's tube and then by the citrate method, employing an open operation on the donor and Robertson's bottle as originally described.

The demonstrations were all well attended and were highly instructive.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

WEDNESDAY, JUNE 30TH.

PUERPERAL SEPSIS.

THIS section opened on June 30th, with Dr. HERBERT WILLIAMSON, as President.

Mr. VICTOR BONNEY (London), in opening the discussion on Puerperal Sepsis, said that the solution of the problem how to prevent, and how to cure, septic infection of the puerperal uterus, necessitated the correct answering of three questions: 1. What is the original source of the organisms? 2. How do they get into the uterus? 3. What is their exact situation by the time they have produced symptoms of sepsis? He was of opinion that the infection, in most cases, originated from an intrinsic source, and not from organisms conveyed from patient to patient. Speaking broadly, the occurrence of the disease at the present day is sporadic, not epidemic, a point in favour of the view he had expressed. He thought from a consideration of the facts that the antiseptic precautions in use up to the present time have been efficient in preventing infection in which septic organisms are conveyed from one patient to another. There was no doubt that organisms capable of producing puerperal sepsis commonly pre-exist in a woman, particularly in relation with the ano-perineal skin. In other words, the commonest cause of puerperal sepsis was, in his opinion, fæcal infection. Although it was difficult to apply Listerian principles in their entirety to obstetric work, he advocated the exclusion of the perineum and anus as far as possible by fixing over it a large gauze-pad soaked in some antiseptic. Practical sterilisation of the peri-anal skin may be effected by the use of a 1 per cent. solution of equal parts of crystal violet and brilliant green in half-and-half alcohol and water. A 2 per cent. solution of iodine

is also effective. Mr. Bonney considered that for all purposes except Cæsarean section, even for examination only, the lithotomy position is preferable. With regard to the modes by which organisms reach the uterus, he thought that although in a few cases they may be carried there by hands or instruments, in the large majority of instances they reach the organ by natural currents. The speaker observed that, as a rule, puerperal sepsis is not associated with the retention of gross fragments of placental tissue in the uterus. Furthermore, the organisms are situated *in* the uterine wall almost from the beginning of the infection, and soon extend beyond it viâ the veins or lymphatics.

The problem of treatment of puerperal sepsis is, he said, very difficult. Immediate sterilisation by flavine or Milton's solution, where sepsis is suspected, is probably valuable in preventing extension. The common practice, however, of giving an intra-uterine douche with the idea of washing away and killing the organisms in the uterus is senseless and harmful. Mr. Bonney was not in favour of scraping the uterus, unless it could be carried out quite early and be followed by the insertion of irrigating tubes in the Carrel-Dakin manner. Under such conditions he thought that it would be the means of arresting the infection in many cases. It must be done if at all within 12 hours of the temperature rising. As to the value of vaccines and antitoxic serums in the treatment of puerperal sepsis he was frankly pessimistic. He was, however, favourably impressed with the results obtained by ligaturing or excising the ovarian vessels and lymphatics.

Surgical Treatment of Puerperal Sepsis.

Mr. BECKWITH WHITEHOUSE (Birmingham), in an opening paper on the Surgical Treatment of Puerperal Sepsis, observed that a study of the statistical tables of the Registrar-General showed that the risks of sepsis to the parturient woman were very real. There could be little doubt from the results published that the existing everyday methods of treatment were unsatisfactory, and that in this respect the science of obstetrics had not advanced appreciably within recent years. He then proceeded to contrast the pathological conditions obtaining in a septic puerperal uterus with those in a deep-infected muscular shell wound. The similarity was very close, both as regards the nature of the infecting organisms and the position of the same. Mr. Whitehouse traced the evolution of treatment of war wounds and referred to the very great advance that was made by the institution of the Carrel-Dakin method. By applying Carrel's continuous irrigation to the septic uterus from the earliest stage possible he was of opinion that the present mortality rate might be lowered. He had within the past two years treated 15 cases of very severe sepsis by this method with only one death. With regard to curetting the septic uterus, there are undoubtedly grave risks both of extending the infection and also of perforating the soft tissues. He had found it a useful asset to the Carrel-Dakin method, but sounded a note of warning with regard to its general adoption and use by irresponsible individuals. It should not be employed unless *continuous* irrigation with hypochlorite solution was instituted at the same sitting. The speaker then referred to the possibilities of intravenous medication in those cases of puerperal sepsis where organisms have reached the blood stream. He had recently with good effect been employing a solution of flavine, 1–1000 in normal saline, intravenously in cases of puerperal septicæmia and pyæmia. Flavine has the great advantage for intravenous injection that it is a non-protoplasmic poison and has no effect upon the red or white corpuscles.

Intravenous Protein Therapy in Puerperal Septicæmia.

Dr. A. E. GOW (London) spoke in support of intravenous protein therapy in puerperal septicæmia. He said that with the introduction of intravenous injection of "peptone" as an accessory to sensitised vaccine a considerable step forward in the treatment of pyogenic septicæmia had been made. Of the various preparations of peptone on the market Witte's is the best for the purpose. Ten grammes are dissolved in 100 c.cm. of water containing a little sodium bicarbonate. The solution is boiled and filtered, and from 8 to 10 c.cm. are given intravenously as the first dose. The injection is made slowly, Nolf's technique being employed. The occurrence of a rigor following the injection is an excellent sign, and in the speaker's experience often marked the turning point of the disease. Peptone treatment is a useful accessory to other methods, but Dr. Gow did not make any extravagant claim to its success in all cases. As regards autogenous vaccines, the causal organism, in most cases the *Streptococcus pyogenes*, can be isolated more quickly from an intra-uterine swab than from the blood stream.

Serums and Vaccines in Puerperal Infection.

Dr. LEITH MURRAY (Liverpool) continued the discussion with a paper upon the Value of Serums and Vaccines in the Treatment of Puerperal Infection. He was of opinion from a consideration of the literature that the employment of serums or vaccines is not attended by results so satisfactory as to exclude the use of other forms of inoculation therapy. He urged that steps be taken early and not late in the course of a case of septicæmia when probably nothing could save the patient. He did not agree with the customary division of puerperal infection into toxæmic and septicæmic groups. The distinction is merely between a grave and a very grave condition. In the interval when diagnosis by blood culture is being made, he thought that it is not only legitimate but highly advisable to give antistreptococcus serum. With regard to vaccine treatment Dr. Leith Murray was of opinion that a stock vaccine is never advisable in acute cases. Autogenous vaccines, however, especially when combined with serum, appear to be of distinct service. The best results are obtained in the subacute cases. In conclusion, he expressed the opinion that the patient's best interests are not served by the usual present-day practice of treating cases of puerperal septicæmia in ordinary fever hospitals. Public health authorities must be informed that an expert on the treatment of puerperal fever cannot be created in six months and that the services of an officer specially trained for this work should be obtained.

Discussion.

Mr. S. L. GRAHAM (Birmingham) referred to the work at the Women's Hospital, Birminham, where a special ward for the treatment of puerperal sepsis was established. From an experience of 800 cases with a mortality of 143 he was frankly pessimistic about the present methods of treatment. He had tried vaccine and serum therapy for two years and had now given it up. His present treatment consisted essentially of good nursing with intra-uterine douching. The majority of the patients in the puerperal ward slept out of doors.

Dr. EARDLEY HOLLAND (London) observed that treatment is certainly very chaotic as shown by the diversity of methods described. He thought that one of the most important points in the discussion was the autogenous method of origin. He was in complete agreement with Mr. Bonney's suggestion, and for this reason advocated the abolition of vaginal examination in favour of rectal examination in obstetric work. For ten years he had not made a vaginal examination except in complicated cases.

Dr. AMAND ROUTH (London) observed that no definite proof had been brought forward that either *B. coli* or the *Streptococcus fæcalis* were always the causal germs, and for this reason he was not prepared to agree with Mr. Bonney that puerperal infection was usually of autogenous origin. With regard to treatment, he thought that intra-uterine douching was of great importance immediately after delivery of the placenta in all cases of complicated labour.

Dr. FRANCES IVENS (Liverpool) called attention to the preparation of a patient before labour commenced. She was of opinion that if the same precautions were taken as before a surgical operation the incidence of puerperal infection would be much reduced. She also advocated the employment of serum therapy at an early stage of the disease.

Dr. J. P. HEDLEY (London) said that one of the great difficulties in dealing with puerperal infection was to know which patients were going to get well and which were going to die. It was also important, amongst the diversity of methods advocated, not to kill the patient with treatment! He was impressed with the results of the Carrel-Dakin method described by Mr. Whitehouse, and he intended to apply the same when the occasion arose.

Dr. A. LAPTHORN SMITH (London) felt that a great deal of the mortality at present attached to puerperal infection could be avoided if adequate surgical precautions were taken before labour commenced. He drew attention to the importance of adequate drainage of the uterus and stated that he did not believe in curetting a septic uterus.

Dr. R. C. BUIST (Dundee) observed that in arguing from results from any new methods two facts must be remembered. One was the natural response of the patient to treatment, whatever it may be. The other was the incorrectness of deducing principles without having recourse to very long lists of cases.

Dr. F. DEIGHTON (Cambridge) spoke in support of the remarks of Dr. Ivens and Dr. Lapthorn Smith. One of the difficulties of adequate surgical preparation before obstetric work was the fact that the principle was not generally recognised.

Dr. R. J. JOHNSTONE (Belfast) called attention to the important difference that existed between puerperal sepsis of the uterus and septic infection of adjacent parts. As regards the origin of infection he was in accord with the views expressed by Mr. Bonney, and had held this opinion for ten years. He was not so pessimistic about treatment as some speakers appeared to be, and thought that reasonably good results could be expected if proper care was adopted. He did not curette the uterus as a routine but only when shreds of sloughing endometrium were being discharged.

Dr. R. J. ROWLETTE (Dublin) spoke in favour of vaccine therapy, and especially of autogenous vaccines. If it was impossible to isolate the infecting germ from the blood-stream a uterine swab should be taken. He advocated a small initial dosage, the first dose being not greater that 5 millions.

Dr. F. EDGE (Birmingham) was of opinion that vaginal douching, except in hospitals, should be abolished as a routine treatment of puerperal infection, and advocated thorough examination under an anæsthetic in all bad cases.

Dr. PARRY referred to the difficulty of treating a confinement as a surgical operation in general practice, and thought that nearly all cases of puerperal fever were due to infection by the doctor or nurse in attendance.

Dr. PECHÈRE (Brussels) was in complete agreement with what various speakers had said about prophylaxis. In Belgium puerperal sepsis was very common in the larger towns, although it was not frequent in the maternity clinics, where proper precautions were taken. He spoke in favour of the use of peptone and serum therapy.

The PRESIDENT, in closing the discussion, drew attention to the need for more detailed examination of post-mortem material. He also thought that obstetricians in the various large centres throughout the country should periodically meet and discuss results in order to further any special line of inquiry or treatment. With regard to Mr. Bonney's theory of autogenous infection, he did not consider that the acceptance of the same relieved the practitioner one iota of his personal responsibility. As to Mr. Whitehouse's treatment by the Carrel-Dakin method, he thought that the author intended that such treatment should be carried out in institutions. There were dangers in indiscriminate curetting, and although it had undoubtedly its place in treatment, the indications at present were not such as to warrant its general adoption. He fully concurred with Dr. Leith Murray's suggestion that the treatment of puerperal fever should be severed from the general fever hospital, and Birmingham had led the way in this respect.

SECTION OF ELECTRO-THERAPEUTICS.

FRIDAY, JULY 2ND.

Presidential Address.

Dr. A. E. BARCLAY (Manchester), in his presidential address to the section, referred to the granting, by the the University of Cambridge, of a diploma in medical radiology and electrology, and the establishment of a complete course of study in these subjects in preparation for it. The granting of this diploma opened a new era in the history of radiology and electrology, and a higher standard than has been possible in the past will be attained in the future. The need for a full course of instruction and a diploma was greater than had been realised. An entry of nearly 30 had been obtained for the first examination in July, 1920, and more than 12 had commenced the second course of training for the next examination in December, 1920.

Mr. H. S. SOUTTAR (London) opened a discussion on

The Diagnosis and Treatment by Electrical Methods of Paralysis Due to Nerve Injuries.

Electrical methods were of special value in affording an early indication of recovery after injury. A change in the nature of the response of the muscles to galvanic current, from slow to quick, was a sign that recovery would take place, and this change could be noted long before the return of faradic excitability. Regarding electrical treatment, the opener held the opinion that electrical currents were of much value, mainly on account of their power to cause the paralysed muscles to contract and do work. Faradic currents were also of value because they caused normal muscles in the same limb to contract, thereby helping the circulation in the limb, protecting the tendons from adhesions, and keeping the joints free.

Dr. W. J. TURRELL (Oxford) attached much importance to the use of electrical methods for diagnosis. The faradic and galvanic currents were of most value for this purpose, and could provide information on the condition of the nerve and the degree of degeneration of the muscle.

Dr. F. HERNAMAN-JOHNSON (London) said that the condenser method of testing would give an early indication of the arrival of the regenerating motor nerve at the muscle. He believed that, in treatment, muscles should not be made to contract until some voluntary power had been regained.

Dr. NOEL BURKE (London) spoke of the electrical testing of motor nerves exposed during surgical operation and of the information that could be obtained by this process on the physiological continuity of nerve trunks in the region of injury.

Dr. C. WORSTER-DROUGHT (London) described the condenser method of testing reactions. In his experience with some 2000 cases, this method provided accurate indications whether the nerve injury was sufficiently severe to demand surgical treatment. After nerve suture and the expiration of a period of delay, testing by condenser discharges decided whether recovery was taking place, before return of voluntary power.

Dr. HOWARD HUMPHRIS (London) mentioned the use of the melted paraffin-wax bath in preparation for subsequent treatment. The reddened, moist, and slightly greasy condition of the skin rendered the latter ideal for massage.

A paper by Dr. ROBERT KNOX (London) on

Radiography of Tumours of the Chest

was read by Dr. SHILLINGTON SCALES owing to the absence of the author due to illness. The paper dealt with the tumours found in the chest wall, in the mediastinum, and in the lungs. The X ray appearance of these tumours was described and their differential diagnosis was fully considered. The paper was illustrated by several lantern slides. In the discussion that followed, Dr. IRONSIDE BRUCE (London), Dr. H. BLACK (Birmingham), Dr. HOPE FOWLER (Edinburgh), Dr. FLORENCE STONEY (Bournemouth), and Dr. J. HALL-EDWARDS (Birmingham) took part.

Dr. S. GILBERT SCOTT (London) read a paper on

The Diagnostic Value of the Renal Outline.

After referring to its appearance in normal kidneys, kidneys of abnormal size, and kidneys with abnormal

shadows, he described his method of determining the relation of abnormal shadows to the kidneys by means of the respiratory excursion of the kidney and the presence or absence of movement of the abnormal shadow. If the latter moved to the same extent and in the same direction as the renal shadow the abnormal body must be connected to the kidney.

Professor J. GOODWIN TOMKINSON (Glasgow) read a paper on

X Ray Therapy in Oriental Sore.

Three cases were treated. One of these, which had received ionisation earlier without apparent benefit, was cured by nine weekly applications of X rays filtered through ½ mm. aluminium. Each dose was a half sabouraud. The second case was also cured. The third was still under treatment and was improving.

EXHIBITION OF SURGICAL AND ELECTRICAL APPLIANCES, DRUGS, AND FOODS.

I. *Surgical Apparatus, including Electrical Appliances and Scientific Instruments*—*Continued from p. 96.*

A review of Division I. can be well completed by a reference to four exhibits of particular interest. The Sanborn Company, of Boston, Massachusetts, exhibited the Benedict Basal Metabolism Apparatus which has recently been brought into use to determine the oxygen consumption of patients in the treatment of goitre, hyperthyroidism, anæmia, diabetes, and so forth. This ingenious apparatus, designed by Dr. F. G. Benedict of the Carnegie Nutrition Laboratory, measures the inspired and expired air, so that the amount of oxygen entering the lungs and the amount leaving can be determined, the difference representing that used in the body, a "respiratory quotient" being thus established. The determination needs no laboratory analysis, the oxygen consumed being shown by a direct reading from the scale of the apparatus. Another instrument shown here was a combination blood-pressure outfit and stethoscope for use in surgical operations, giving advantages to both operator and anæsthetist. Mr. W. H. Pettifor, of 11, Victoria-street, London, S.W., presented a range of "electrical aids for the deaf" of various pitches, and possessing different wave-form characteristics. This was described as a special form of telephone made up of three parts, the receiver or ear-piece, the transmitter or microphone, and a small dry battery. A test instrument was also shown, enabling a prescription to be written to give the most suitable pitch, sound-wave form, and volume of sound for each individual case. The test set enables a combination of 90 different instruments to be prescribed. This suggestion of standardisation attracted considerable interest. An apparatus generating oxygen at will was exhibited by the Hydrogen, Oxygen, and Plant Company, Ltd., of 1, Albemarle-street, Piccadilly, London, W., the gas being generated from simply the contact of "oxylithe" with water. This substance is stated to be prepared by an electro-chemical process from sodium peroxide. There is complete control over the apparatus as to the quantity of oxygen evolved. The suggestion is that the possession of this apparatus by the physician makes him independent of a cylinder supply. A related gas, of course, is ozone, the production of which was illustrated in the exhibit of Ozonair, Ltd., of 96, Victoria-street, Westminster, London, S.W. There were here shown the latest designs of apparatus producing ozone from the air for, amongst other things, the treatment of respiratory diseases, for purifying the air of the sick room, for the sterilisation of water, and for the bleaching of coloured materials.

II. *Drugs, including Antiseptics.*

Colloids, synthetics, organic arsenical preparations, and glandular extracts seemed to occupy most of the attention of both visitor and exhibitor, and the display was quite comprehensive in character, attracting general interest.

The disclosures of the ultra-microscope formed a real scientific show, and facilities were given for an inspection of this with objects in view at the stall of British Colloids, Ltd., The Crookes Laboratories, 22, Chenies-street, Tottenham Court-road, London, W.C. When correctly staged the Brownian movement and the orbit of the ultra-microscopic particles were fascinating to watch, reminding the observer of the phenomenon of the spinthariscope (radium bombardment). A well-defined series of colloidal preparations was shown, including metals, non-metals, and one alkaloid—quinine. As is correctly stated, the essentials are not new drugs; they are simply familiar medicaments in a new form—a form in which their therapeutic efficiency is remarkably increased, while objectionable side issues are to a large extent avoided. Under the term "oscols" Messrs. Oppenheimer, Son, and Co., Ltd., of 179, Queen Victoria-street, London, E.C. (who claim to be the introducers of the advantages of colloidal medication), exhibited a series of metallic and non-metallic colloids of a permanent character, their condition being controlled by careful laboratory examination. The exhibit included examples of palatinoids, the preserving power of these capsules being noteworthy. Phosphorus, ether, organic extracts are thus kept unimpaired.

The progress achieved in the chemical manufacture of British-made synthetics and drugs found significant illustration in the exhibit of Messrs. Boot's Pure Drug Co., of Nottingham, where was presented a series of admirable specimens, including aceto-salicylic acid, acetanilide, saccharin, hexamine, butyl, chloral, orthoform, and certain alkaloids and glucosides. The antiseptics shown included mercuric potassium iodide and chloramine-T. All branches of pharmacology were well represented at the artistic exhibit of Messrs. Burroughs, Wellcome, and Co., of Snow Hill Buildings, London, E.C. Notable amongst the things shown guaranteeing purity, accuracy, and reliability were the arsenic synthetics replacing effectively German salvarsan and neo-salvarsan. Organo-therapeutic preparations formed a feature of this exhibit. In addition to apparatus for oxygen inhalation with or without alcohol, and an interesting laboratory device for the determination of nitrogen in compressed oxygen, and of carbon monoxide in gas mixtures, Messrs. Reynolds and Branson, of Leeds, exhibited a number of pharmaceutical preparations made on skilled lines. Such were their series of elixirs, gargles, and concentrated tinctures. General interest was shown in the exhibit of bacterial vaccines at the stall of Messrs. Parke, Davis, and Co., of 50, Beak-street, Regent-street, London, W., produced in the inoculation department of St. Mary's Hospital under the supervision of Sir Almroth Wright. The series included the pneumonia phylacogen and hormone preparations, and glandular substances. The correct choice of a liquid paraffin for medicinal purposes was illustrated by the Wm. Browning Co., Ltd., of Albert Works, Park-street, London, N.W. Apart from the pure oil itself with an approved viscosity a new product was shown called "semprolax," which by a special process renders liquid paraffin palatable, free from oily taste and appearance, and yet containing, according to claim, 80 per cent. of the intestinal lubricant. Messrs. C. J. Hewlett and Son, of 35–42, Charlotte-street, London, E.C., were to the front with their well-known original preparations, including the mist. pepsinæ co. c. bismutho, and the physiologically standardised extract of ergot, both of which have stood the test of clinical experience for a good many years. The art of reducing fluids to fine spray was well illustrated at the stall of Mr. Frank A. Rogers, of 327, Oxford-street, London, W., where was shown a profusion of atomisers and spray apparatus adapted for close and effective application to nose and throat of various medicaments, whether of an oily nature or merely aqueous solutions.

Drug standardisation was amply exemplified in the exhibit of the Hoffmann-La Roche Chemical Works, Ltd., of 7 and 8, Idol-lane, London, E.C. Specimens were exhibited of digalen, a sterile solution of the active principle of the fresh leaves of digitalis showing a uniformity of composition, and therefore therapeutic activity. In addition were exhibited specimens of omnopon, a fluid presenting the total alkaloids of opium in a soluble form and suitable for injection. A stable combination of omnopon with scopolamine is also prepared.

(To be continued.)

THE LANCET.

LONDON: SATURDAY, JULY 17, 1920.

Health in the Last Year of War: the Influenza Figures.

THE year 1918 was, for the bulk of the inhabitants of this island, the most strenuous and the most anxious time within human memory. It opened with a period of unexampled depression during which the manhood of the country was fighting against an ever-advancing army in the field, while the women and children of the country were carrying on bravely at home in circumstances bordering more and more on actual privation. True, the tide soon began to turn, but it was not until late in the year that the strain was relaxed. Before this occurred the country was visited by a scourge of epidemic disease without parallel since the cholera outbreak of 1849. Anyone conversant with the effect of such outward conditions on the physical health of the community must have prophesied a rate of mortality higher, much higher indeed, than that of quiet and peaceful times. Sir BERNARD MALLET, whose report we summarise on another page, nevertheless declares the year to have been one of extraordinary healthiness. The civilian deaths during the year numbered 587,828, making a death-rate of only 17·1 per 1000. Of these deaths only 10·5 per cent. were those of infants under 12 months of age. Enteric fevers were so minished as to have lost their significance as a cause of death. Cancer showed an appreciable decrease on the previous year's record. The first impression produced on the reader by the Registrar-General's figures is one almost of incredulity, attended with a growing thankfulness to those who had the ordering of public hygiene and whose faithful work was rewarded in so dramatic a manner. The intensive industry and compulsory temperance of the population were certainly contributory factors.

The influenza epidemic did not, of course, run out during the year, and this fact has induced the Registrar-General to take the exceptional course of issuing a separate report[1] which has only just appeared. The main features of the epidemic have long been known, but this panoramic survey, while confirming many of the conclusions reached from partial views of the outbreak, puts some in a truer perspective and modifies or disproves others. The deadly character of the disease has never been brought out so clearly as in the table showing that in the fourth quarter of the year 1918 the mortality among women of 25 to 30 was 540 times greater than the average for the same quarter of the four preceding years. On the other hand, we are informed, contrary to usual belief, that pregnancy did not add appreciably to the risk of death, and in the circumstances it couid indeed hardly have been expected to. The report brings out the great similarity in type of the disease throughout the whole of the country. Heart disease, for instance, was uniformly recorded as a complication much more frequent in the first wave than in the second. Bronchitis, too, became less common in all areas as time went on. In two important particulars the epidemic differed materially from that recorded by Dr. WILLIAM FARR. In 1847 twice as many people (in proportion to population) died in the more insalubrious parts of London as in the less unhealthy. The pandemic of 1918–19 was no respecter of persons either in regard to health or wealth. In the first wave it is true that the wealthier parts of London and the healthier boroughs were let off lightly, but in the second wave Dives shared the fate of Lazarus. In 1847 Dr. FARR noted that influenza especially attacked persons labouring under other zymotic diseases; in 1918–19 there was no evidence of any such association.

It looks, indeed, as though the overwhelming intensity of the infection over-rode any initial variations due to environment or local resistance. The first wave, which spent itself by the end of July, hit the towns much more severely than the rural areas, and was at its worst in East Lancashire and West Yorkshire. It was followed by an interval of four weeks in which the mortality stood at the modest figure of fourfold its normal rate. The second wave respected no region, however remote and isolated, and levelled out all claims of relative immunity. Places like Jarrow, which practically escaped the first bout, suffered with special severity from the second. In the north, when the second wave seemed to be abating, it returned again with a fresh lease of virulence, due apparently to a reinfection from the south. The intermission of mortality between the second and third waves was neither so prolonged nor so complete as that between the first and second. Late involvement seemed to confer a certain amount of protection in the first wave, but no advantage accrued in this respect in the other waves. Of local variations in intensity the most that can be said is that on the whole the county areas were progressively less severely affected as one proceeds south. Who desires to study in detail the record of his own area will find material for so doing in this amazingly complete survey. The epidemiologist will be able to draw from it lessons of value for the future, but not without prolonged study.

[1] Cmd. 700, H.M. Stationery Office, price 1*s*. 6*d*.

Consultation Fees.

WHATEVER changes may have occurred in the methods and habits of consulting physicians and surgeons or in the circumstances of the patients sent to them for advice, their fees have remained unchanged for a generation or more as far, that is, as the discreet cloud of mystery that surrounds consultation fees admits of clear comparison. We know that the traditional two guinea fee, when it represented a vastly greater purchasing power than it now does, was often reduced in the case of the patient whose financial handicap was indicated to the consultant by the family doctor who sent him. But we imagine that the handicapping was always to the disadvantage of the consultant, who drew no larger fee whatever the affluence of patients who visited him. In contrast therewith a sliding scale of fees has always been in use by the general practitioner of medicine, because his knowledge of the financial standing of his various patients was generally no less intimate than that of their physical frailties. Naturally, this cannot be the case to the same extent in consulting practice, and may account for the anomaly of the fixed fee. It is an arrangement which, to speak frankly, has worked none too well in the past, and with the redistribution of wealth which has recently taken place is likely to work still less well in the future. We called attention a fortnight ago to an experiment in graduating consultation fees initiated at the suggestion of a

London business house. The scheme contemplated for a person with an income of £350 or under a reduction of the operation fee to 10 per cent. of the normal, and of the fee for consultation and treatment to 25 per cent. The rest of the scale is given in brief as follows:—

Adjusted income.	(a)	(b)	Adjusted income.	(a)	(b)
Under £350 ...	10 % ...	25 %	Under £700 ...	30 % ...	45 %
,, £400 ...	12½ ,, ...	27½ ,,	,, £800 ...	40 ,, ...	50 ,,
,, £450 ...	15 ,, ...	30 ,,	,, £900 ...	45 ,, ...	55 ,,
,, £500 ...	20 ,, ...	35 ,,	,, £1000 ...	50 ,, ...	66⅔ ,,
,, £600 ...	25 ,, ...	40 ,,	,, £1500 ...	60 ,, ...	Full.

The "adjusted income" shown in the first column includes any private means as well as the salary of the employee, and is to be ascertained by deducting one-fifth of the total income on account of a wife, and one-tenth on account of each child, or other dependent member of the household. Cols. (a) and (b) represent the proportion of fees payable for (a) operations; (b) consultations, treatment, or nursing home fees. A minimum of 1 guinea is fixed for a single visit.

It will be seen that the full consultation fee will not be paid until the patient has an income of more than £1000 a year, and the full operation fee not until his income exceeds £1500 a year. Seeing that a series of physicians, surgeons, and specialists of repute have accepted these conditions it is evident that some, at all events, of those in consulting practice in London are prepared to admit that their normal fee is in the nature of a maximum, the important question being, having regard to the modesty of the maximum, for how many patients is it applicable, and, in particular, for how many is it too low. The scale outlined above, be it noted, only defines the proportion of the fee payable without fixing its actual amount. It is open, therefore, for any physician or surgeon accepting such an arrangement to fix the norm at any level which he chooses; and obviously if he is to accept the reduced fee in a large proportion of the cases in which he previously received the full one it would be only fair for the consultant, especially for the consultant physician, to place his norm at a higher level than that of the now usual 2, 3, or 5 guineas, and in so doing obtain from the affluent a proper equivalent for his skilled advice.

In the scheme we have quoted the employer makes inquiry into the patient's income, including any private means which he may possess. Inquisition of this sort would, we think, be found to be resented except as applied impersonally to the staff of large business firms. In other cases it seems to us that the income-tax return might be used, instead of, for example, any employer's voucher. The information given by a patient to his medical attendant is already of so confidential a nature that he need hardly hesitate to disclose to him also the amount of his net income. This information would still remain between the surveyor, the doctor, and the patient, and the patient would not be taking his employer into his confidence. Such a system would enable the principle of graduating consulting fees to be carried out on a larger scale than that at present suggested.

Outdoor Medical Officers of the Ministry of Health.

THE invitation of the Ministry of Health to candidates for appointments upon a projected outdoor staff was accompanied at the time that it was made by the information that a committee would consider the applications and make recommendations to Dr. ADDISON thereon. As we announced at the time, this committee included medical men of high standing, representing different parts of the country, the Civil Service Commissioners, and the Ministry of Health, but for obvious reasons it was not thought convenient to announce the personnel of the body until its delicate work of selection had actually been performed. In another column of this issue of THE LANCET there will be found the names and qualifications of the Selection Committee, its report to the Ministry of Health upon the applications received for the appointments under the Ministry, and the names of the medical men whose applications for engagement have been successful. These appointments embody the conception of medical referees, set out by the British Medical Association. Their holders will have functions which are primarily administrative, but the early duties may be largely clinical, inasmuch as the officers will take the place, as official referees, of the consultants who have been acting hitherto in this capacity under private arrangement with the Approved Societies. The new officers will act as expert advisers for the authority responsible for the clinical service, and will probably have supervisory power in the administration of the service.

It will be seen, therefore, that the appointments form an important link in the chain of medical organisation, bringing the local health authorities into touch with the hospital and special services that may be provided in the future. This is of particular interest because with all the vast opportunities for organised development which underlie the activities of the new Ministry of Health, there is an inevitable risk that some of the plans of reform, so far from simplifying medical practice, may actually complicate it by the erection of various forms of administration and supervision. As a matter of fact, the new outdoor staff of the Ministry of Health should fit in well with the development of Primary Health Centres, which is the first great principle of the Report of the Consultative Council of Medical and Allied Services. At a meeting of the Bath and Bristol Branch of the British Medical Association held in Bristol last week Lord DAWSON expounded this Report, and had the advantage of doing so in a county where regulations had been proposed for medical practice which in some of their essential features were an actual forecast of the recommendations of the Consultative Council. For Dr. MIDDLETON MARTIN, medical officer of health of the county of Gloucester, with the assistance of the practitioners in the district, has devised a scheme under which general practitioners could be brought into relation with primary or cottage hospitals, staffed by themselves, which could be connected with the secondary hospitals in the larger towns, that is with the great voluntary institutions as we know them. The Gloucestershire scheme has not reached the stage of fruition, but it will now develop with the added prestige of forming a pattern to the country of the method by which the general practitioner can at last use his powers for good in a proper environment. And while the Report of the Consultative Council proposes to bring into connexion the general practitioner's ordinary work, centring around primary centres, with the work of consultants and teachers, as represented by the activities of the voluntary hospitals, the new appointments by the Ministry of Health of outdoor medical officers should bring the local health authorities into touch with all forms of domiciliary and institutional medical service.

Annotations.

"Ne quid nimis."

TYPHUS IN POLAND.

THE appeal from the committee seeking funds for the help of Poland is reinforced by such information as is received, but it has been difficult heretofore to get out of Poland a full account of the typhus epidemic. Dr. Norman White's public lecture on Thursday evening, under the auspices of the Chadwick trustees, will have contributed greatly to public enlightenment. In the *Military Surgeon* (Washington, D.C., U.S.A.) for June there is a report by Colonel Harry L. Gilchrist, Medical Corps, U.S. Army, dated in January, 1920, which tells how appalling the situation was then, and from it we quote below. Colonel Gilchrist was sent to Poland in May, 1919, by the President as head of the American Typhus Fever Expedition, detailed generously from the United States Army Medical Corps.[1] The expedition works under the Polish Minister of Health. Typhus, says Colonel Gilchrist, has been epidemic in Poland for four years (1920 will make the fifth); it became far more serious after the armistice. It is always being freshly imported by returned prisoners and refugees from Russia and the Ukraine, of whom two and a half millions entered Poland in 1919, less than half of them Poles. In Russia and the Ukraine the epidemic originates. People there die by thousands, their bodies piled in great heaps awaiting burial. Poland realises their condition, and out of charity does not refuse entrance to these pitiful refugees. She establishes quarantine stations, but people come in such crowds they cannot be handled, and so the epidemic is spread. Bolshevik commanders, it is stated, release typhus sufferers from Russia in trains near the frontier, so that they must drift into Poland. As a rule Denikin's garrisons left behind were garrisons of typhus fever. Galicia is also suffering. Whole towns are crippled, schools and business suspended. In North-East Poland American inspectors report disease infecting nearly every home. Poland has been so ravaged by armies that destitution is widespread. Mostly people live on potatoes, beets, and other vegetables; sometimes they have no fuel to cook them. Yet Poland is making efforts to deal with typhus, and is doing its best even to train doctors and nurses, but it lacks financial resources and sanitary supplies for this overwhelming emergency. Major Willis Baker, one of Colonel Gilchrist's inspectors, wrote from his station:—

"843 beds in hospital, mostly typhus, but also tuberculosis, dysentery, relapsing fever, and small-pox. An August convoy of 200 had 30 cases of typhus on arrival, 150 more cases developed in a few days. The staff remained uninfected till December, when 400 prisoners were passing through daily, of whom 80 per cent. were infected, and disease then broke out among officers and workers, and of eight doctors seven got typhus. Patients are lying on the floor or on board platforms. There are no beds. There is no bedding, but straw and paper blankets; no hospital clothing, no medicines, no instruments, no hospital linen or equipment, almost no lavatories or latrines. The whole place is foul and terrible. A great shortage of eating utensils; 800 simple pots to feed 800 patients, who are in the most extreme misery."

Lieutenant-Colonel Register, Medical Corps, U.S. Army, died of typhus in January last, but, knowing well their risks, the whole American expedition volunteered for another year of service. Colonel Gilchrist sums up the needs of Poland as: soap in thousands of tons, hospital linen and underclothing in hundreds of thousands of sets, hospital equipment for thousands and thousands of beds; and declares that unless checked "this epidemic will threaten the whole of Europe. The situation at present is getting beyond control." We commend to our readers the appeal we published last week from the committee begging them to tell their friends how extreme is Poland's need.

[1] THE LANCET, March 20th, 1920, p. 671.

THE TOXIC FACTOR IN MIGRAINE.

As in the case of many functional diseases, the pathology of migraine is not definitely known and is the subject of controversy. A reflex neurosis arising from irritation of organs such as the stomach, uterus, or eyes, a vaso-motor disturbance, and a toxæmia (of the nature of which there is dispute) are some of the hypotheses which jostle one another. In the *Presse Médicale* MM. Ph. Pagniez and A. Nast have brought forward strong evidence in favour of the toxic nature of the condition. Their paper has the merit of producing experimental evidence in place of the speculations with which eminent writers have for a generation regaled the profession. They point out that in the great majority of cases of migraine the crisis cannot be provoked at will, but the majority of patients know conditions which favour its appearance. In some it is some article of diet, a glass of wine or a liqueur; in others muscular fatigue; in others emotions or departure from regular habits, such as times of meals, going to bed, or rising. But when the patient exposes himself to the cause of the attacks the crisis usually does not occur immediately, but after a period of several hours or even of more than a day. There is therefore a period of elaboration in the organism before the crisis. Another important fact is that many patients notice that for days after an attack they can take whatever they like with impunity. These facts appear to have a humoral basis, as the following case shows. A strong, intelligent man had been migrainous since childhood. He received considerable benefit from small doses of peptone before meals, but when the treatment had been stopped for a certain time the crises reappeared. Several causes would start an attack. Among these was the taking of chocolate, particularly milk chocolate, but when he took a cachet of peptone before meals he could commit with impunity imprudences which he usually carefully avoided. His case was investigated experimentally. Half a gramme of peptone was given before meals. Experimental meals consisting of bread, milk, and chocolate, in quantities up to 100 g., were given, without preliminary administration of peptone. Digestion leucocytosis followed and migraine did not occur. Then the peptone was stopped, and two days later he was given a meal containing 60 g. of chocolate with the same result. But an experimental meal, given nine days after stopping the peptone, was not followed by leucocytosis but by leucopenia (3700) and an attack of migraine. It is noteworthy that the prophylactic treatment conferred an immunity which lasted several days after its discontinuance. Similarly, an attack of migraine is followed by a period of immunity. MM. Pagniez and Nast conclude that the essence of the disease is some humoral modification which renders the subject liable to an attack—a sort of temporary anaphylaxis. Upon the rapidity with which this state is reconstituted after an attack depends the degree of the disease. The exact nature of the humoral modification is not known. It is not surprising that if the crisis can be provoked by certain articles of diet, the action of which is comparable to anaphylaxis, the disease may be cured or suspended by a therapy of "alimentary anti-anaphylaxis."

THE SUPPLY OF SPIRITS IN HOSPITALS.

IT is interesting to note that during the Committee stage of the Finance Bill, which was taken last week, Clause 2, which provided for the continuation of the increased medicine duties was agreed to, as also was Clause 3 dealing with increased duties on potable spirits. On reaching Clause 4, however, which refers to the use of spirits in medicinal preparations or for scientific purposes, a discussion arose on the question of allowing a rebate on all spirits used in hospitals on prescription. The point at issue was whether hospitals should be permitted to obtain potable spirits free of duty. One argument put forward in favour of this concession was that during the war military hospitals, guided by medical representation, obtained spirits free of this tax. When the spirit is mixed with drugs there is a partial

abatement allowed, but in the case of potable spirits there is no such abatement. The Financial Secretary of the Treasury opposed the suggestion on the ground that the greatest possible care was required not to leave any holes by which evasion of the duty on wines and spirits was possible. If such a concession were made, he maintained, the Board of Customs would be entirely in the hands of the staffs of hospitals throughout the kingdom, and it would be a very great responsibility to throw on them. The use of potable spirits in our hospitals, according to statistics, appears to have decreased considerably, and so the fact that the suggestion of a rebate on such supplies was rejected may not prove to be a very serious economic matter.

SCLERODERMIA AND PITUITRISM.

IN 1917 Alibert described for the first time under the name of scleremia a morbid syndrome characterised by cutaneous sclerosis, afterwards re-named sclerodermia. Although its association with other affections, such as myxœdema, exophthalmic goitre, and the frequent occurrence of pigmentation have suggested a theory of a plurality of sclerodermic forms, little has been achieved in lifting the veil which surrounds its true pathogenesis. With the prevalence of new views regarding the importance of the endocrine glands, theories of the pathogenesis of sclerodermia naturally gravitated towards these fresh ideas, and invoked as causative agent changes in the thyroid, pituitary, or suprarenal capsule. We are indebted to Dr. Izar for the publication of a case with full details, which throws some light on the causation of sclerodermia and its relation to pituitrism.[1] The patient was a girl, 7 years of age, who developed an extensive sclerodermia on the neck, face, thorax, and antero-external surface of the limbs. The cutaneous thickening was so great that the child resembled a wax doll. The mother and sister were short and fat, suggesting the pituitary type, and a radiogram of the child's skull showed some enlargement of the sella turcica. But the chief interest of the case lies in the result of the pharmaco-dynamic reactions. For instance, neither adrenalin, pilocarpine, atropine, endothymin, endothyroidin, nor endo-ovarin gave rise to any reaction worthy of mention, while on the other hand injections, both of total pituitary extract (hypophysin) and of pituitin in doses of $\frac{1}{4}$–$\frac{1}{2}$ c.cm., induced rise of temperature, increased arterial tension, and slowing of the pulse to a marked degree. With this positive reaction a therapeutic course of pituitary extracts was commenced, with the result that after the sixth daily injection of $\frac{1}{2}$ c.cm. the sclerodermic lesion began to recede. By the forty-ninth day, after 16 injections of hypophysin and 16 of pituitin, there only remained some pseudo-œdema on the neck, forearms, and legs, and treatment was continued by the administration of half a tablet of Byla's hypophysin on alternate days by mouth. All signs of the skin affection had disappeared at the end of six months. The striking and beneficial action of this opotherapic cure would seem to establish without doubt the pituitary origin of the cutaneous lesion in this case.

SMOKING AT WORK.

THE question of labour efficiency in relation to tobacco-smoking has been revived in a prominent fashion by the increasing practice of smoking in the workshops. It seems clear that in many cases the practice is tolerated by authority, and the anti-tobacco protagonists may soon be expected to put forward their case against this innovation, based on the ills to which it may give rise, when the evils of nicotine will be emphasised. The abuse of tobacco is well recognised, and that the smoke from it, especially when inhaled, has definite toxic properties must be admitted. A few years ago we furnished analyses from THE LANCET Laboratory showing how the smoke from cigarettes, pipes, and cigars differs, amongst other things, in nicotine content.[2] The results showed that while nicotine is a highly poisonous constituent of tobacco, the evidence was not conclusive that this alkaloid invaded the consumer to the extent hitherto accepted. There was more nicotine found in the smoke from the cigar and pipe than from the cigarette, the suggestion being that in the last case a large proportion of the nicotine was destroyed by combustion. There are, however, other bases found, probably of a toxic character, and there is present also an appreciable amount of carbon monoxide. Certain processes which entail the manipulation of poisonous materials, such as lead and arsenic, must always contra-indicate smoking, since the toxic substances may be carried to the mouth by soiled fingers, pipe stems, or cigarettes, and the same contra-indication exists where there is risk of fire or explosion. But when all is said we must face the fact that those who have acquired the habit of smoking are more contented when permitted to indulge in it and are irritable when it is prohibited. To-day the psychology of the worker is rightly receiving more and more attention, and a real and strong case must exist before anything which promotes contentment is prohibited. Smoking on an empty stomach—e.g., before breakfast and more than three hours after the last meal—seems to be felt injuriously by many subjects, while smokers generally appear to hold that smoking directly after meals promotes digestion; the belief is widespread and calls for consideration. The custom now rapidly increasing in industrial work of introducing short mid-morning and mid-afternoon pauses, during which time tea-trolleys go round with light refreshment—a practice recommended as long ago as 1861 by medical men—provides reasonable opportunities for allowing smoking. Cases have even been quoted of increased output following permission to smoke; but we are not aware of any data of scientific value either to justify or to contradict this claim. The question, which is not without importance, calls for investigation, and, we suggest, is worth the attention of the Industrial Fatigue Research Board.

THE SERUM TREATMENT OF CHANCROID.

THE amount of research carried out in connexion with the serum treatment of ulcus molle is surprisingly small and, apart from Ito's investigations, little has been done to explore this particular field. In a paper read early this year at a meeting of the Swedish Medical Society, Dr. J. Reenstierna[1] gave an account of his experiences with a serum prepared at Professor Pettersson's bacteriological laboratory, and tested in about 100 cases of chancroid with bubo formation at Professor Almkvist's venereal department of the Karolinska Institute. The serum was obtained from large rams which were given intravenous injections of increasing quantities of killed and living cultures of Ducrey's streptobacillus. In the "autoreferat" of his paper, Dr. Reenstierna does not give further particulars as to the dosage of these injections which were repeated over a long period before the serum was used. In the matter of complement fixation, the serum was proved to be definitely specific, but agglutination tests could not be satisfactorily carried out owing to the granular clumping which suspensions of Ducrey's streptobacillus exhibit even before the addition of agglutinating substances. Other laboratory tests of the specific properties of this serum could not be carried out for want of suitable material, but the clinical tests were strikingly convincing. Within 24 hours of an intramuscular injection of 10 c.cm. of the serum marked improvement was observed; the inguinal glands became less painful and swollen, and the overlying skin less inflamed. Dr. Reenstierna has attempted to augment the therapeutic action of this serum by the addition of killed, thermogenic bacilli, such as typhoid bacilli, and he advocates this double-barrelled therapy because, after many years' experience of the serotherapy of gonorrhœal arthritis, he has found the benefits obtained to be proportional to the degree of fever provoked. Ducrey's streptobacillus, like the gonococcus, is very sensitive to a temperature only a few degrees above

[1] La Riforma Medica, May 22nd, 1920.
[2] THE LANCET, April 6th, 1912.

[1] Svenska Läkaresällskapets Förhandlingar, Hft. 3 and 4, 1920.

the normal body temperature, and an injection which provokes fever should, in Dr. Reenstierna's opinion, prove beneficial on this account. His achievements certainly seem to confirm his claims, and Professor Almkvist, who took part in the following debate, paid an appreciative tribute to the indefatigable efforts which had yielded such promising results. Negative confirmation of the specific properties of the serum was found in its failure to provoke any reaction, favourable or otherwise, in seven cases wrongly diagnosed as chancroid. The aspiration and bacteriological examination of pus in the inguinal glands revealed staphylococci, not Ducrey's streptobacilli. As for the cases of true chancroid, they usually cleared up altogether within little more than a week. Usually two injections were given with an interval of four or five days, and in no case did a relapse occur. Dr. Reenstierna publishes details of a case of suppurating bubo which had persisted for more than a year and which responded with dramatic effect to serotherapy.

ACUTE EPIDEMIC ENCEPHALITIS.

WITHIN a period of three days at the latter end of May three cases were admitted into the wards of the London Hospital presenting symptoms of encephalitis with unusual features and all ending fatally. The clinical manifestations accord in a striking manner with those of a condition described by Sicard and Kudelsky at a meeting of the Société des Hôpitaux de Paris on Jan. 23rd of this year under the name of "encéphalite aiguë myoclonique." It is of interest to note that Sicard points out that the cases he described are in turn similar to those described by Dubini in 1846 under the name of electric chorea. The London Hospital cases are described in detail in this week's issue of THE LANCET by Dr. Arthur W. M. Ellis, assistant director of the medical unit in that institution, in a paper which should be of interest to all our readers. He points out that similar cases have been recorded in France since Sicard and Kudelsky's original description by a series of observers, while cases of identical character have been observed and recorded in Switzerland, America, and Germany. Dr. Ellis has not been able to find any cases recorded in this country previous to those observed by himself, though myoclonic contractions have been described as a late sequel of lethargic encephalitis. The first of Dr. Ellis's cases was a labourer aged 17 years, the second a child of 6, the third a Jewess aged 28, who was pregnant. The initial symptom in every case was vomiting, followed in two of the three by severe pain in the lower part of the abdomen and the thighs. Obstinate constipation was invariable and in every case complete retention of urine, necessitating frequent catheterisation, occurred. Severe and complete insomnia progressing to wild delirium seems to be an important and distressing feature, and apparently the only drug inducing any degree of quiet in these patients is hyoscine. The most characteristic feature, however, is the shock-like contractions, chiefly of the abdominal muscles, occurring at the rate of 30 or 40 to the minute, and often more marked on one side. The forceful character of these movements is shown by the fact that in two of the patients they caused a pulling down of the lower ribs and a lifting upwards of the pelvis. The pupils were widely dilated in all these cases, but the dilatation disappeared with the onset of coma. Profuse sweating, leading to sudaminal or miliary rashes, also occurred, and there was a moderate degree of fever. Speech was jerky, indistinct, and slurred in two of the cases, but frequently rational periods occurred in the intervals of the delirium. Some paresis of the eye muscles occurred in one case and was doubtfully present in a second. Nystagmus was observed in one of the cases only. A well-marked leucocytosis with increase in the polymorphonuclears was present in all three—a point of distinction between these cases and ordinary lethargic encephalitis. The cerebro-spinal fluid was clear, but showed slight increase in cells and in the protein content in all three. Dr. Ellis was fortunate enough to obtain autopsies on two of his three cases, the only gross lesion observed being a moderate degree of cerebral congestion. He proposes to report on the histological conditions found later. He is to be congratulated on the prompt publication of the details of the clinical features of his cases, thus drawing the attention of the profession in this country to an interesting condition. Attention has already been pointedly directed to the lethargic type of encephalitis, but in addition to this now classic picture there is the paralysis agitans type observed in this country, the hyperkinetic form first described in Australia in 1918, the myoclonic form dealt with in this note, while neuralgic, choreic, psychic, and tabetic forms have been adduced. Economo in his most recent article [1] points out how widely the disease has varied in different areas and at different times in the same area since the first outbreak of the epidemic. In the present Austrian epidemic the somnolent ophthalmoplegic cases only number about 30 per cent. of the total, and at least 60 per cent. show excitation phenomena of one kind or another. In this country, where the number of cases has been much smaller than on the continent generally, the great variations which may occur in the clinical picture have not been so widely recognised. It is to be hoped that practitioners encountering cases in their practice similar to those which Dr. Ellis puts on record will examine and record them carefully or transfer them to institutions where they can be scientifically investigated. Dr. Ellis rightly points out that the identity of causation of his cases with that of the lethargic cases of encephalitis, though probable, has yet to be established. We hope that the London Hospital Medical Unit will continue work on the lines indicated by Dr. Ellis's communication, for collective investigation of other cases, if, as seems likely, they become more frequent, may yield results of great interest and importance.

THE BOGUS "DOCTOR."

THE medical profession is unfortunate in that it apparently offers more temptation than any other to fraudulent persons to pretend to be members of it with a view to victimising their fellows. Having once done so, they find the way of the transgressor easy so long as it remains open, and even after having been caught and convicted they are apt to resume their evil courses at the earliest opportunity. In short, the bogus doctor is a criminal who is a specialist, just as much as the abortionist, who is sometimes a bogus doctor, the trained pickpocket, or the blackmailer; and he is assisted by the credulity of others. Medical men, if not actually brought in contact with him, and even those who are, do not always take the precaution of establishing his identity, and laymen, who fall into his hands, being usually members of the more ignorant classes, have not sufficient knowledge or sufficient observation to detect him. A man convicted at Bow-street a short time ago and sentenced to nine months' imprisonment with hard labour was an example of the sham-medical recidivist, for he had quite recently undergone 18 months' imprisonment for posing as a medical practitioner and signing death certificates when acting as a locum tenens. He was an instance of ability to impose easily upon a selected victim, for he had obtained £25 from a cartage contractor, presumably a business man, by pretending to be a medical practitioner and to have invented a cure for cancer which he valued at £40,000—a story which would have secured his undoing if told to a medical man. The impostor had, as a matter of detail, first made the acquaintance of the prosecutor at a watering place by saluting him as a brother freemason, and giving correctly the signs and tokens of the degree which he claimed to have. Whether he was in fact a freemason, and how far the belief that he was one assisted him in obtaining the money, is not stated, but it may be worth the while of medical men to note the case. We do not recall any previous instance of this method of self-introduc-

[1] Wien. klin. Wochenschr., 1920, xxxiii., 329.

tion or self-recommendation being employed for the purpose of fraud. It will therefore be as well to remember that the credentials of a stranger desiring to be engaged as a locum tenens or accepted as a medical colleague are not to be considered with less care because he also alleges the common bond of freemasonry. As has been suggested above, to judge from the frequency with which cases are reported in the newspapers, no other learned profession is so liable to temporary adoption for nefarious purposes as medicine. Sham officers abound, but they are a temporary by-product of the war. The Church and the Law offer few opportunities to the dishonest, and sham solicitors, if they occur occasionally, can only expect success so long as they can keep out of contact with genuine members of the legal profession. This is not easy for them to do, and their sphere of operations is thus narrowed considerably.

PARAPLEGIC MULTIPLE SCLEROSIS.

Dr. Archibald Church,[1] of Chicago, states that a generation ago multiple sclerosis was regarded as an absolute rarity in the United States, mainly because only the classical picture, as manifested by nystagmus, intention tremors, and scanning speech, was recognised. On the other hand, like other neurologists, he has found that *formes frustes* and aberrant types have recently been recognised much more frequently than formerly. In addition to the generalised classical form of multiple sclerosis, which is infrequent except as the terminal phase of the fractional forms, he has encountered the following clinical types: a cerebellar type, a rare early manifestation of the disease which tends to become fully developed fairly rapidly; an optic atrophy type, which is not uncommon and only slowly merges into the generalised condition; a paraplegic type, which appears to be the commonest of all, and which very slowly assumes the features of upper level and cerebral involvement; and lastly, a very rare monoplegic type. The paraplegic type to which Dr. Church draws special attention begins with weakness or clumsiness in one leg or foot, which not infrequently leads to stumbling or rather severe falls. This irregularity in gait may improve or seem to subside completely after being present for weeks or months, but there is only a temporary remission. Contrary to previous descriptions, sensory disturbances, both subjective and objective in character, are not uncommon in this type of multiple sclerosis. The most important signs of the disease when the lower extremities are mainly or exclusively affected are ankle clonus, Babinski's sign, and unilateral partial or complete abolition of the umbilical reflex. A lack of uniformity in the affection of the reflexes on the two sides is frequently observed. In the late stage sphincter control is not rarely affected, and actual incontinence may occur. Signs of cerebral involvement commonly supervene sooner or later, such as squint, diplopia, optic atrophy, irregularities of the visual field, speech defects, and even mental peculiarities. Treatment is usually disappointing. Dr. Church has tried several cases with intensive courses of mercury, salvarsan, and the iodides, as well as with fibrolysin, without observing any favourable results.

[1] Journal of the American Medical Association, June 12th, lxxiv., p. 1645.

RESEARCH STUDENTSHIPS AT ST. MARY'S HOSPITAL.—The recently formed Institute of Pathology and Research at St. Mary's Hospital has established three post-graduate research studentships with a view to the training of recently qualified men or women in methods of research. Each studentship is of the value of £200 a year, and is tenable for six months, with the possibility of extension to 12 months. Preference is to be given to graduates from St. Mary's Hospital Medical School. The appointment may be held in any one of the seven departments of the institute, according to the choice of the individual student. The following have been appointed for the first six months in the departments of anatomy and embryology, general and special pathology, and chemical pathology respectively: Dr. Ida Mann, Dr. Joan Ross, Dr. Samuel Simms.

MINISTRY OF HEALTH: OUTDOOR MEDICAL STAFF.

As announced in THE LANCET of March 20th the Minister of Health appointed a Committee to assist him in the selection of suitable candidates for the post of Medical Officer of the Ministry of Health, for which applications were then invited, in the following terms:—

The medical officers will be required to perform such duties as may be assigned to them by the Minister from time to time. These duties will include:—

(*a*) Acting as referees on questions of incapacity of insured persons for work, and giving second opinions on questions of diagnosis and treatment;
(*b*) Organising the arrangements for work of part-time medical referees for the area; and
(*c*) Assisting in the administration of the Insurance Medical Service.

The country will be arranged in territorial areas, and each officer will be required to reside in the area assigned to him.

The rate of remuneration will be £1000 per annum, rising by annual increments of £50 to a maximum of £1400, and no war bonus will be payable in addition thereto. Officers appointed to this scale will be established civil servants with the usual pension rights.

Applicants who are of the age of 50 years and upwards who may be appointed will not be established, but will receive a total remuneration fixed at £1400 a year (non-pensionable), and in such cases the appointments will be for a limited term of years.

Applicants must be medical men of not less than ten years' standing, and preference will be given to those having wide experience of general practice, especially amongst the industrial population.

The Committee have presented to the Minister the following report:—

Report.

1. We have the honour to report to you the result of our deliberations pursuant to your minute of March 24th, 1920, whereby we were appointed members of a committee to consider applications of candidates for appointment as medical officers of the Ministry and to make recommendations to you of candidates suitable for appointment.

2. The total number of applications received was 1325. Of these, 1242 were in respect of English and 83 in respect of Welsh appointments (certain candidates applying under both heads).

3. In our consideration of the Welsh applications we have had the benefit of the assistance (in accordance with your desire) of Dr. Meredith Richards.

4. After careful consideration of the applications and testimonials of the candidates we selected for interview 159 of those applying for English appointments and 14 of those applying for Welsh appointments.

5. The instructions printed on the form of application required each candidate to give the names of three persons able to speak from personal knowledge of his qualifications for these appointments. In the case of each candidate selected for interview these persons were communicated with before the interview, and the replies received were duly considered.

6. We think it proper that you should be informed as to the considerations by which it has appeared to us that our judgment should be guided in the selection of candidates suitable for the discharge of the duties of these posts. We have carefully weighed, in regard to each candidate, the evidence of his qualifications in the following respects:—

(*a*) Medical degrees and diplomas, academic distinctions, and early clinical experience in resident appointments at hospitals.

(*b*) General clinical experience: (i.) in general practice, especially practice among the industrial population in England or Wales; and (ii.) in other fields of medical practice, whether in civil life or as a medical officer of His Majesty's Forces.

(*c*) Experience as a medical referee, whether in connexion with National Insurance, Workmen's Compensation, the work of the Ministry of Pensions, or otherwise.

(*d*) Experience of National Health Insurance administration, as a member of an Insurance Committee or otherwise, and other administrative experience—e.g., in public appointments or in military service.

(*e*) Professional and public reputation in the district in which the candidate practised.

(*f*) Personal characteristics, including presence, force of character, and tact.

7. Certain candidates were pre-eminently suitable in some of the foregoing respects and some in others; and we have not attached preponderating weight to any particular set of considerations, but have viewed each candidate's qualifications on balance as a whole.

8. We regarded it generally as important that candidates should not be below 40 or above 55 years of age, but a few

younger or older candidates were otherwise so exceptionally well qualified that we have not hesitated to include them among those recommended as suitable for appointment.

9. In the case of the Welsh appointments we attached importance to a knowledge of the Welsh language.

10. We submit for your consideration the enclosed list of names of 55 candidates suitable for appointment in England and names of 8 candidates suitable for appointment in Wales.

11. Our report to you would be inadequate without the expression which we desire to make, of our sincere appreciation of the great assistance rendered to us by Dr. McCleary and Mr. Fitzgerald, the secretaries of the Committee. Their efficiency, diligence, and courtesy have reduced to a minimum our labours in endeavouring to do full justice to so large a number of candidates of whom a relatively high proportion merited interview.

The Report is signed by the whole of the Committee of Selection, which was constituted as follows:—

T. W. Shore, M.D., M.R.C.S., L.R.C.P. (Chairman), Dean of the Medical School, St. Bartholomew's Hospital.

E. Collingwood Andrews, M.D., B.Sc., Consulting Medical Officer to the Hampstead Maternity Home.

Sir Hamilton A. Ballance, K.B.E., C.B., M.S., F.R.C.S., Surgeon, Norfolk and Norwich Hospital.

(Nominated by the Civil Service Commissioners.)

Professor R. A. Bolam, O.B.E., M.D., M.R.C.P., Honorary Physician, Skin Department, Royal Infirmary, Newcastle-on-Tyne; Professor of Medical Jurisprudence, University of Durham.

H. G. Dain, M.B., M.R.C.S., L.R.C.P., Chairman of the Birmingham Insurance Committee.

Professor Arthur J. Hall, M.D., F.R.C.P., Senior Physician, Sheffield Royal Hospital, Professor of Medicine, University of Sheffield.

Sir Walter Kinnear, K.B.E., Controller of National Health Insurance, Ministry of Health.

E. J. Maclean, M.D., M.R.C.P., Senior Gynæcologist, Cardiff Infirmary, Lecturer on Midwifery, University College, S. Wales.

J. Smith Whitaker, M.R.C.S., L.R.C.P., Senior Medical Officer, Ministry of Health.

G. F. McCleary, M.D., W. T. Fitzgerald, Joint Secretaries.

The Selected Medical Officers.

Dr. Addison has decided, with the concurrence of the Treasury, that 30 whole-time officers should be appointed for England and three for Wales at the inception of the scheme, and the following are the selected medical officers for England, leaving one vacancy to be filled:—

G. Ashton, 2, Palatine-road, Withington, Manchester.
S. A. Bontor, Great Berkhamstead.
T. L. Bunting, Scotswood-on-Tyne.
T. M. Carter, Burnley, Westburn-on-Trym, Bristol.
W. Davidson, 91, Wimborne-road, Bournemouth.
W. Duncan, 169, Ashley-gardens, S.W. 1.
J. Gray Duncanson, 1, Ranelagh-villas, Hove, Sussex.
G. W. Eustace, Maltravers-street, Arundel.
A. Heath, 66, Otley-road, Harrogate.
A. Linnell, Paulerspury, Towcester.
M. G. McElligott, 23, Standish-gate, Wigan.
W. Moir, Belgrave-square, Darwen.
D. G. Newton, 7, Gladstone-road, Sheffield.
J. Orton, Great Heath House, Coventry.
R. Paterson, 247, Boundary-street, Liverpool.
B. A. Richmond, 34, Bromley-road, Catford, S.E.
W. Rigby, 16, St. Alban's-place, Blackburn.
B. M. H. Rogers, 14, Mortimer-road, Clifton, Bristol.
J. Dill Russell, Osman House, Fortis Green, E. Finchley, N.
H. L. Rutter, 31, West Parade, Newcastle-on-Tyne.
E. W. Selby, 13, Hall Gate, Doncaster.
H. Sinigar, Western-road, Southall, Middlesex.
G. K. Smiley, 20, Kedleston-road, Derby.
M. R. Taylor, 64, Churchfield-road, Acton.
J. F. Walker, Rocklands, Clifton-terrace, Southend-on-Sea.
H. A. Whitcombe, Locharwoods, Formby, Liverpool.
E. H. Willock, 91, London-road, Croydon.
C. R. Wood, 75, Langdale-road, Hove.
A. Young, 43, Collegiate-crescent, Sheffield.

For Wales the following have been appointed:—

J. Evans, Bron Menai, Carnarvon.
D. N. Morgan, Gilfach Goch, Nr. Bridgend.
T. R. Llewellyn, Penygraig, Glam.

For England it has also been decided to appoint four medical officers of higher grade, who will be designated divisional medical officers and will superintend the work of the whole-time and part-time medical officers in the divisions assigned to them respectively. The following have been appointed to these posts.

Divisional Medical Officers.

R. E. Crosse, 68, Nightingale-lane, S.W.
A. Fulton, Armoy, Old Basford, Nottingham.
C. H. Milburn, 13, York-place, Harrogate.
H. J. Neilson, Shandon, St. George's Hill, Weybridge.

In Wales the senior medical officer of the Ministry for that country will discharge the functions, as regards the outdoor medical staff, which are discharged in England by the divisional medical officers.

Part-time Appointments.

In addition to these whole-time appointments it is understood that part-time appointments will later be considered, when payment will be made by session or by case. Applications for these appointments have not yet been invited.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

MEETING OF COUNCIL.

A QUARTERLY meeting of the Council was held on July 8th, Sir GEORGE MAKINS, the retiring President, being in the chair.

The PRESIDENT reported the re-election of Sir Anthony Bowlby and Sir D'Arcy Power and the election of Mr. Francis James Steward to fill three vacancies in the Council (see THE LANCET, July 10th, p. 104).

Diplomas in Public Health were granted jointly with the Royal College of Physicians to 35 candidates found qualified at the recent examinations.

The Council passed a vote of thanks to Colonel L. A. Waddell, late I.M.S., for his valuable gift of crania to the Museum, and to Sir Charles Tomes for presenting to the Museum the sections of teeth made and used by him and his father in their researches into the comparative anatomy of the teeth.

The following recommendation was received from the Committee on the Special Primary Examination for the Fellowship:—

That on account of the delay which has occurred in the demobilisation of officers in the Army in the East (India, Persia, Mesopotamia, &c.) an additional First Professional Examination for the Fellowship under war conditions be held in May next, and that it be definitely stated that such examination is to be the last held under special war conditions.

This recommendation was approved and adopted.

A letter, dated July 5th, was read from Sir Frank Colyer resigning his membership of the Board of Examiners in Dental Surgery in anticipation of the expiration of his period of office on Oct. 14th next, and his resignation was accepted.—The PRESIDENT stated that the vacancy thus occasioned would be filled up at the next meeting of the Council.

The Council elected the following professors and lecturers for the ensuing year:—

Hunterian Professors.

Arthur Keith: Six lectures on the Principles of Craniology Applied to Clinical and Racial Problems.

William Sampson Handley: One lecture on the Pathology and Treatment of Lupus.

Walter Goldie Howarth: One lecture on Mucocele and Pyocele of the Nasal Accessory Sinuses.

Charles Walter Gorden Bryan: One lecture on the Early and Late Effects of Injuries of the Diaphragm, with special reference to wounds jointly involving thoracic and abdominal viscera.

Harry Platt: Two lectures on the Surgery of the Peripheral Nerve Injuries of Warfare.

Alfred Geo. Timbrell Fisher, M.C.: One lecture on Loose Bodies in Joints.

Arris and Gale Lecturers.

Frederick Wm. Edridge-Green: One lecture on the Cause and Prevention of Myopia.

Joseph Faulkner Dobson: One lecture on the Function of the Kidneys in Enlargement of the Prostate Gland.

John Howell Evans: One lecture on the Azygos System of Veins in their Association with Surgical Affections.

Erasmus Wilson Lecturer.

Samuel George Shattock: Six demonstrations on pathological specimens in the Museum.

Arnott Demonstrator.

Arthur Keith: Six demonstrations on the contents of the Museum.

Thomas Vicary Lecturer.

Sir D'Arcy Power, K.B.E.: One lecture on the Education of a Surgeon under Thomas Vicary.

Sir Anthony Bowlby was elected President for the ensuing year. Sir Charles Ballance and Sir John Bland-Sutton were elected Vice-Presidents.

A vote of thanks to Sir George Makins for his services as President during the past three years was passed.

The following were admitted as Honorary Fellows, and were entertained to dinner at the College by the Council in the evening: Dr. A. Depage, Brussels; Dr. Pierre Duval, Paris; Dr. J. M. T. Finney, Johns Hopkins University; and Dr. Charles H. Mayo, Rochester, U.S.A.

REGISTRAR-GENERAL'S EIGHTY-FIRST ANNUAL REPORT, 1918.

Sir Bernard Mallet's report on the vital statistics of England and Wales in 1918 has recently been issued, addressed to Dr. Addison, as Minister of Health. The Registrar-General summarises his report in a comprehensive introduction, in which the year under notice is declared to have been one of extraordinary healthiness, notwithstanding the exceptional prevalence of influenza towards its close. The civilian deaths in 1918 numbered 587,828, and corresponded to a rate of 17·6 per 1000 of the estimated population—which rate is reduced to 17·1 by correction for age distribution of the living. The extent of the reduction has been increased during the war by the withdrawal from the civilian population of males at an age when mortality is below the general average. But this effect has been masked by the high influenza mortality of 1918 which occurred at these ages. If the record of 1918, apart from epidemic incidence, had not been an extremely good one, comparison with past years would have been far less favourable. And if a true idea of the public health is desired it is necessary to ascertain what the mortality would have been in the absence of this epidemic. "The first 40 weeks of the year showed a very good record indeed," in spite of epidemic influence: it would therefore be wrong to speak of 1918 as a period of excessive fatality, without discriminating between the mortality due to influenza and that due to other causes. It is unfortunate that the real trend of mortality during the three years 1916–18 should have been obscured, first by the deterioration of the male population already referred to, and, in addition, by the epidemic fatality of the last few weeks of 1918.

The following is a summary of the chief features of the mortality of the year:—

Of the total deaths registered in the course of 1918 only 10·5 per cent. were those of infants who had not completed their first year of life. This is by far the lowest rate of *infant mortality* recorded, the percentage so recently as 1901–10 having been 22·6. The change is partly due to increased influenza fatality at the higher ages, but mainly to the rapid fall of infant mortality, and to reduction in births. In terms of total births, infant mortality in 1918 was equal to 97 per 1000, or 9·3 per cent. below the average in the ten preceding years. It is one of the lowest rates on record, only three previous years having experienced infantile mortality of less than 100 per 1000 births. The provisional figures for 1919 show a rate of 89 per 1000, or 2 per 1000 below that of 1916, which was the lowest rate hitherto attained. The comparison, however, is affected by the fact that in 1916 the birth-rate was falling, whilst it was rising in 1919; and when the necessary allowance has been made for these movements the rates for the two years appear to be about equal.

As compared with the preceding year enteric fever, measles, and diarrhœa showed a lower mortality, whilst scarlet fever, diphtheria, and whooping-cough showed a higher. The deaths from *enteric fever* numbered 950, of which 65 occurred among non-civilians. The resultant mortality, 26 per million living, is the lowest ever recorded in this country. To some extent the fall is due to absence, on foreign service, of a large number of men of the ages at which enteric fever mortality is highest. The remarkable fall from 300 deaths per million living in 1869 to 26 in 1918 may be followed in a new table, which indicates that the loss of life from this eminently preventable disease is now only one-third of what it was even ten years ago. The disease is rapidly losing its significance as a cause of death in this country.

The great *influenza epidemic*, which commenced about midsummer in 1918, increased the deaths from this cause from the 5000 to 10,000 usually recorded in a year to no less than 112,329 in the year under notice, the corresponding death-rate being equal to 3129 per million living. In addition to this the epidemic led to a large increase in the loss of life assigned to diseases of the lungs, including tuberculosis. The total deaths attributable to influenza have been estimated to number 132,000. Owing to the exceptional importance of this outbreak and to its continuance until the following spring, it has been dealt with as a whole in a special report now in preparation.

Tuberculosis in its various forms accounted for 58,073 deaths, or 2139 more than those so classified in the previous year. Of these, 1369 were deaths of non-civilians. The mortality among the civilian population amounted to 1694 per million, a figure in excess of the total mortality recorded for any year since 1904. The increase of mortality was probably due to the epidemic of influenza, had it not been for which tuberculous mortality in the year under notice would probably have shown some reduction on that of 1917. The mortality from influenza among sufferers from phthisis is known to have greatly exceeded that of the general community. Notification has not enabled us to do more than estimate the number of the phthisical population, but if the average duration of the disease be taken at about three years there should be about 60,000 female sufferers in England and Wales. The remarkable increase in deaths from tuberculosis in lunatic asylums has been continued throughout 1918, when the fatal cases amounted to 5605, against 4189 in the previous year, and an average of 1800 in the three years 1912–14. This increase has occurred notwithstanding a decline in the number of inmates. A committee which investigated the causes of increased mortality in asylums ascribed the principal share of the increase to reduction in quantity and deterioration in quality of food (particularly flour). Other considerations mentioned as of secondary importance were deterioration of the asylum staffs and want of space for isolation, owing to the evacuation of some asylum buildings for war purposes, and consequent congestion of the remainder. The increase of asylum mortality is considerably greater among the male than among the female patients, a fact which seems to point to deficiency of staff as an important cause, because the demands upon the female staff for special war service would naturally be less than upon the male.

Cancer mortality, if stated in the form of an ordinary crude death-rate, was higher in 1918 than in any other year, but if comparison be made by means of standard rates which allow for the present abnormal age constitution of the male civilian population, there will be seen to have been an appreciable decrease from the previous year's record. Standardisation fails to eliminate entirely the fictitious increase due to the exclusion from the population in war years of a large number of men furnishing very few deaths from cancer. An attempt at a fuller correction, on this account, shows that the standardised cancer mortality of 1918 was probably lower than that of 1911–14 also.

The successive reports from 1915 onwards show how seriously the efforts of the department for the improvement of the national statistics have been hindered by the late war. In our notice[1] of the vital statistics for 1917, shortly after the appearance of the official report, we commented on the difficulties encountered by the Central Office since the outbreak of hostilities, with especial reference to the measures successfully employed for their removal. The present report covers ground which is in some degree common to each of the three preceding. As a conspicuous instance of this, reference may be made to the serious disturbance of

[1] See THE LANCET, June 24th, 1919, p. 1034.

the population directly caused by enlistment for foreign service, in consequence of which there has been derangement of the birth and death ratios when contrasted with those of peace times. After more than five years of war and the aftermath of war it may surely be hoped that the former valuable achievements of the National Statistical Bureau will shortly be renewed. In reviewing the vital statistics of the several years since the outbreak of hostilities Dr. T. H. C. Stevenson has discussed very fully the difficulties of estimating populations, both for the whole of England and Wales and for its various subdivisions. These difficulties have been greatly increased by the war, which has resulted in rendering the methods relied on in normal times useless for the purpose. He has also described in detail the modifications of method resorted to from time to time in framing the population estimates. Returning to the subject on the present occasion, Dr. Stevenson again refers to the independent sources from which the civilian populations of separate localities are derived. These are (1) the National Register, of which a count was made for the purpose in the middle of 1918, and (2) the returns made under the rationing of food scheme. For various reasons neither of these enumerations, devised, as they must have been, for other purposes, can be considered wholly satisfactory from the statistical point of view. It is believed, however, that the food returns have improved with the successive issues of coupons, and for this reason these have chiefly been relied on for 1918, the National Register count being used as a check in certain cases of special difficulty. The results thus obtained are certainly superior to any that could have been prepared in the Central Office by dependence upon the methods formerly employed in the absence of these exceptional sources of information. The changes due to war have been so great that these methods, unreliable even in peace time, would have been practically worthless. The food-rationing returns of local populations unfortunately afford no information on which estimates can be based for subdividing these populations by sex and age. Moreover, inasmuch as the methods upon which they have depended in the past have been rendered useless by the migration attending the war, these estimates cannot be prepared until the census of 1921 is available for the purpose. Their absence has again necessitated the omission or substantial modification of many of the tables usually appearing in these reports.

It should be remembered that throughout this Report the death-rates of males in 1918 are invariably based upon civilian deaths and civilian population. This is necessary, both because of the impossibility of ascertaining the average military population of each district and because experience has shown that under the system of transferring deaths to the area of previous residence civilian deaths alone can in war time be tabulated for local areas.

Mr. Arthur H. Sandiland, late registrar to the Islington Tuberculosis Dispensary, died on July 7th while being conveyed to the Royal Free Hospital in a motor-omnibus in which he had been taken suddenly ill. Mr. Sandiland, who was 72 years of age, received his medical education at St. Bartholomew's Hospital and qualified L.R.C.P. Lond., M.R.C.S. Eng. in 1869.

HOSPITAL SUNDAY FUND.—**The following church** collections, &c., have been received at the Mansion House up to June 27th.

£670: St. Columba's (Church of Scotland), Pont-street; £394: St. James, Piccadilly; £370: Holy Trinity, Sloane-street; £335: Christ Church, Lancaster Gate; £314: St. Michael's, Cornhill; £206: St. Alphage, London Wall, with St. Mary, Aldermanbury, and Westminster Chapel, Buckingham Gate; £175: St. Jude's, South Kensington; £174: Brixton Independent Church; £150: St. Anne's, Stamford-hill, and Whitechapel Primitive Methodist Mission; £147: St. Andrew's, Lambeth; £145: Great Stanmore Parish Church; £139: St. Mary's, Islington; £134: St. Anne's, Soho; £128: St. Jude's, Mildmay Park; £127: Immaculate Conception, Farm-street; £123: All Saints, Margaret-street; £116: St. Philip's, Kensington, and St. Peter's, Belsize Park; £104: Christ Church, Gipsy-hill, and St. Luke's, Redcliffe-square; £103; St. Bartholomew's, Sydenham; £102: Temple Church; £101: Christ Church, Westminster.

The following donations are also announced:—

£500: National Bank of India, Ltd.; £300: Sir John Ellerman, Bt.; £200: Mr. Alexander Miller; £105: Mr. W. H. Cullen; £100: Messrs. Hunt, Leuchars, and Hepburn.

THE

CONSULTATIVE COUNCIL OF MEDICAL AND ALLIED SERVICES:

A DISCUSSION AT BRISTOL.

A MEETING of the Bath and Bristol Branch of the British Medical Association was held at Bristol on July 9th, and was inaugurated by a luncheon given at the Royal West of England Academy, Bristol, by Dr. P. Watson-Williams, President of the Branch.

Dr. Watson-Williams's Luncheon.

Lord Dawson of Penn was the principal guest, while the Lord Mayor of Bristol and the Lord Mayor of Cardiff were also present, as well as prominent representatives of medical interests of all sorts.

Dr. WATSON-WILLIAMS, in proposing the toast of the Consultative Council, attributed the movement culminating in the creation of a Ministry of Health to the efforts for 50 years of the British Medical Association, and in the first instance to Dr. Rumsey, of Cheltenham. He said that the Report of the Consultative Council supported rather than supplanted existing organisation, the object being not the effacement of the present provisions, but their coördination and evolution. He considered that the Council constituted an organised nexus between the Ministry and the medical profession, and might become an official channel by which the profession could give direct expression of its views to the Ministry. But it was certainly of the utmost importance that the medical profession should have some voice in the recommendation of suitable members of the Council if the Council was to exercise its functions in the most useful manner.

Lord DAWSON said that it was by no means a usual procedure for reports made to Ministers to be published for the open criticism of the public and of the section most concerned. That such a course was followed in this instance was due to the liberal-mindedness of Dr. Addison. After congratulating the West Country upon its reputation for the care of the sick, he said that a new chapter was now opening in the story of the hospitals of this country, and that the West of England was once more in the forefront; for already, in the county of Gloucester, a scheme had been laid down by Dr. Middleton Martin, forecasting the Report of the Consultative Council. Under this scheme general practitioners were brought into relation with primary hospitals, which were staffed by themselves, and these primary hospitals were linked up with secondary hospitals in the larger towns. Such a scheme, although it had not yet reached the stage of fruition, showed that here in the West the responsible people were thinking in terms of 1920.

Passing on to a general exposition of the report of the Consultative Council, Lord Dawson said that the provision for the health of the people in hospitals or otherwise was demonstrably inadequate. It needed not to be swept away, but to be expanded and adjusted. Hospitals were inadequate because the population had grown more rapidly than they had done; also because the basis on which hospitals had been distributed was not determined by the needs of local populations, but by the chance existence of public spirit and benevolence in the district; and yet again because recent progress in medicine demanded increased institutional treatment which the present hospital system was not elastic enough to supply. It was not a case merely of providing more hospitals, but of the careful grading and linkage of hospitals. Another reason why change was imperative was to be found in the awakening of the public conscience on health matters; people had now a positive instead of merely a negative conception of health, and there was a sharper demand for preventive measures and for dealing with incipient disease. The general practitioner of the future would require to be more closely identified with preventive medicine and to have access to necessary equipment. The present state of the hospitals proved how completely they had been outgrown. Many hospitals had waiting lists hundreds deep, and this was the more lamentable because these waiting lists comprised the people in whom disease was in its early stages, and whom it was most important to cure from the point of view of the community. The disability from sickness was a great weight upon the nation. In 1916 sickness benefit in England for men alone amounted to nearly 3½ millions of money, representing 6,800,000 weeks of sickness and consequent withdrawal from employment. The average annual loss due to sickness and disablement in the case of both sexes for the years 1914–16 worked out at 270,000 *years*, and in these estimates all light sickness (of shorter duration than four days) was excluded, as well as all maternity cases and cases in sanatoriums. If

an adequate health organisation existed, these figures should at least be halved. The criticism had been levelled at the report of the Council that it would entail a huge expenditure on medical services at a time when the country was impoverished, but he and his colleagues recognised that great wars must be followed by strict economy, and that however desirable certain changes might be, it was necessary to wait for the full development and to do the best that could be done in the meantime. All that was asked at the moment was that stock be taken of the position, that a reasonable review be made of what existed at present compared with what should exist, and that a scheme be devised in sufficient outline to reveal the plan according to which the health organisation of the future should shape. There was already a patchwork of medical services—tuberculosis, venereal, and so on—which had come, each in response to an urgent demand, and not as the result of any ordered policy. The time had arrived to consider the whole position and decide upon the lines of development, after which they should set to work cautiously and tentatively to build up the fabric of a medical organisation which should properly fit national needs. The Consultative Council was quite prepared to find that such a fabric could only be set up step by step. Certain principles must be laid down, but they must be principles which should be capable of some immediate applications, and he hoped that one such application might be made in Bristol.

The burden of the report was simply this: the provision of fabric and equipment, together with freedom of action for doctor and patient. It was fully recognised that the bulk of patients would be seen as heretofore in their own homes or at the practitioners' surgeries; but in each district there should be set up an institution which would contain the necessary equipment for the practitioner to complete and accelerate his work. The primary health centre would be a general practitioner clinic; only in the secondary health centre would the patient be transferred from the care of his own medical attendant. The primary centre was the most important part of the scheme at the moment. The secondary hospitals already existed; the primary hospitals were only represented at present by a few cottage hospitals inadequately equipped. The pecuniary relation between doctor and patient would remain undisturbed by the proper development of primary centres. The laity and the medical profession should discuss this matter together in view of the tendency for certain infirmaries to be handed over to the municipalities. A municipalised service was one step forward to the nationalisation of medicine, and that would be a disaster alike to the medical profession and to the public. This was not a time for criticism on the ground that the scheme would cost so many millions. What it was ultimately going to cost was of small importance. In 1870 many people might have been frightened had they been told that education would cost the country annually 33¼ millions—which was the figure it reached in 1918—but no one at this time of day ventured to urge that less should be spent. The heavy expenditure which some forecasted on these new health arrangements would not come at once, and when it did come it would be more than met by the corresponding gain in national health and efficiency. He hoped that in the West Country, with its traditional munificence in hospital matters, two primary health centres might be set up as an experiment, one of them in the town and the other in the country. They would be of great service to their locality; they would relieve the strain on existing institutions, and they would have the high value of an example to the whole nation.

The LORD MAYOR OF BRISTOL, who proposed the health of representatives from neighbouring towns and counties, expressed his satisfaction that no great expenditure was immediately demanded, for in his position as head of a great municipality he was committed already to raising large sums of money for housing and other purposes. The full scheme was estimated to cost 150 millions a year, of which 90 millions would be for medical men, and 60 millions for nurses and establishment charges. His advice was to hasten slowly.

The LORD MAYOR OF CARDIFF, who responded to the toast, was less pessimistic than his brother magistrate. He had no fears with regard to the eventual finance of the scheme. Once the real meaning of the scheme was understood by the people in the industrial areas—particularly that it was not intended to interfere with the freedom of relationship between doctor and patient—he was sure that they would lend a willing hand to make it a success. He hoped that the scheme would not be worked by existing local authorities; a separate *ad hoc* body should be created in the various districts. He looked to the scheme to mature in 20 years, by which time he believed the results would be magnificent.

The proceedings closed after the health of Dr. Watson-Williams had been drunk, on the proposition of Mr. H. H. WILLS, President of the Bristol Royal Infirmary.

The Meeting of the Bath and Bristol Branch.

Following upon the luncheon, a meeting of the Bath and Bristol Branch was held, Dr. WATSON-WILLIAMS presiding.

Lord DAWSON said that his desire in meeting the branch was to elicit criticism and opinion. The medical profession had now an opportunity such as it had never enjoyed before in its history. It had been an individualistic calling and had shown a certain aloofness from public questions. But there had been growing up in recent years a steadily increasing relationship between the doctor and the community. It was for the profession now to give a lead to the nation on health matters. The public, in whose eyes the profession had gained a heightened esteem owing to the war, was prepared to listen to constructive proposals. The interim report of the Consultative Council was an attempt to systematise medical services. It endeavoured to make the preventive and curative sides of medicine meet in the general practitioner. The general practitioner must be looked upon more and more as the guide in matters of health to the residents of his district. The director of the communal clinic or primary health centre should be a man whose practice was in the district; his post should be a part-time one, paid on a time basis. This was the alternative to a whole-time salaried service. Training would be required for such a post, and this simply meant an extension of post-graduate instruction. Lord DAWSON went on to point out that the methods of investigation and treatment of disease were becoming ever more complex. The more that knowledge advanced, the more was the insufficiency of the general practitioner's equipment demonstrated. Nothing astonished him more as a consultant than the excellent work which was done by men under poor conditions. One of the vital parts of the organisation now foreshadowed was the full participation of the general practitioner in the communal equipment available at the health centre. The ideal primary health centre would have a certain number of rooms available for the examination of patients; there would be X ray provision, particularly for screen examinations, also facilities for blood testing, and so on. The administration would charge a flat rate for the use of the equipment; the pecuniary relation between doctor and patient would remain undisturbed. In the larger centres there might be arrangements for physiotherapy and massage at reasonable charges. There would also be wards, including private wards for patients who could afford to pay for them, though the treatment would be the same, of course, in the private as in the general ward. The various communal clinics which were already growing up would be brought under the wing of the primary health centre. The primary health centre had then to be correlated with the secondary health centre in the shape of the existing hospital in the large town. Here those consultative services, which were envisaged as part of the National Insurance scheme, but were held up by the war, would be available. The consultants would serve on a part-time basis and at scheduled rates, paid by the State. This would attract young consultants, to whom a certain assured income, however small, was a great help in the early days of practice. A great deal depended upon the maintenance of intellectual traffic between the primary and secondary health centres. The cost of the scheme had figured largely in the debate at the recent Representative Meeting, but it was not intended to pepper England with primary health centres right away. He would be content to see a dozen such centres established within a reasonable time.

Dr. J. MIDDLETON MARTIN (M.O.H., Gloucestershire) gave an account of the experiment in his county. He said that while it was more or less a simple matter to provide in the towns the special services now required, the matter was more complicated in country districts. In Bristol, for example, there were 13,000 persons to the square mile, while in Gloucestershire, not one of the most sparsely populated counties, there were only 278. It was out of the question to provide special services adequately for a scattered population on the same lines as one could do it for a compact population. Then the question of a general practitioner came in; it was going to be a disastrous thing for the medical profession if continually certain branches of work were taken away from the general practitioner, and this would not be a good thing for the community either, because the preventive side of public health required a knowledge of the circumstances of the local community and the homes of the people; and who possessed this knowledge to the same extent as the general practitioner? Therefore his aim in Gloucestershire had been to bring the general practitioner into relation with what Lord Dawson's report called primary health centres. The attempt was made to develop the present communal services into one recognised centre where the local practitioners could deal with the cases. The services in question were mainly out-patient services, but a certain number of beds were also wanted. He was now engaged in trying to discover the most suitable

places for such out-stations. The stations would be of a very simple character, but such as to lend themselves to development. The direction of these centres was an important consideration. There had been complaint in the past that medical schemes were under lay direction. Medical matters were so technical that there must be medical direction of such services, and from a plan already in operation in Cheltenham he had conceived the idea of setting up a medical advisory committee, composed, in the case of Gloucestershire, of the general practitioners in charge of the out-stations and the consultants at the hospitals. All medical matters would be referred to that committee, which would be the governing body in medical matters. He did not suggest that all difficulties had been overcome, but sufficient advance had been made to prove the practicability of the idea. As for finance, the complete scheme was not too expensive to be carried out at the present time. The money had been found in Gloucestershire by pooling the sums available for the separate schemes, and in this way sufficient money was found without increasing the estimates.

Dr. MARCUS MILLIGAN (Bath) suggested that in each area, in association with the scheme, there should be formed a local guild of preventive medicine or guild of health, a body whose function would be the collective study of all health matters, as well as health propaganda. All the general practitioners and consultants in the area would be included in the guild, as well as such persons as certifying factory surgeons, the public analyst, some representative of the education authority, members of the dental profession, and also veterinary surgeons, the last in view of the way in which animals communicated disease.

Dr. H. C. BRISTOWE (Wrington, Somerset) spoke of the difficulties in the more sparsely populated rural areas, where the means of communication were mostly not main roads or railways but winding lanes, and the population scattered in small villages, none of them with more than 800 inhabitants, with hamlets and solitary houses in between. Practitioners engaged in work in these districts had not time to go a further five or ten miles to attend the primary health centres in a neighbouring town or larger village. He pleaded for smaller centres, less ambitiously equipped, and distributed more frequently in the sparsely populated districts.

Dr. R. H. NORGATE (Bristol) asked what provision it was proposed to make for chronic cases, such as spinal disease. They all knew in private practice that there were a number of people who could not earn their living and were a burden on their families. What was it proposed to do, if anything, for these?

Dr. WILLIAM GORDON (Exeter) said that his first acquaintance with the scheme inclined him to destructive criticism, but Lord Dawson by his advocacy and Dr. Middleton Martin by his practical experiment had established a case for the primary centre. They were countering the tendency to set up whole-time services, and were restoring to the general practitioner what he ought not to have lost; that was so much to the good. But the scheme as it stood on paper suggested that there was going to be undue interference from the secondary and teaching centres with the general practitioner, and this he would deprecate. Mutual counsel and help there should be, but as little interference as possible. He hoped also that it would not be laid down that those in charge of these centres should keep elaborate routine records. This would interfere with the time available for the care of the patient. Whatever records were kept should be of the simplest kind. Then he thought that the recurring expression "team-work" was unfortunate. The profession in England had been made great by reason of its individuality, and the individualism of English medicine should be most sedulously preserved. After all, the highest human achievements were individual, not the work of a team. The speaker uttered a threefold warning. First, against hustling; secondly, against too much attention to what Labour people were thinking, as Labour showed a disposition to meddle in subjects which it did not understand; thirdly, against the German tradition which magnified equipment at the expense of genius.

Dr. G. T. MYLES (Clifton), while admiring the report as a whole, thought that to express unqualified approval at this stage might mean the handing over by the profession of a blank cheque to the State. The success of the scheme depended entirely on the wholehearted support of every section of the profession, and if very much new work was put upon the profession an adequate remuneration must be given; with this subject the report did not deal. He thought that it would be possible to erect through this scheme with its primary centres nothing less than a whole-time service State-controlled.

Dr. NEWMAN NEILD (Clifton) said that in all schemes for the health of the people there were two possible methods. One was to let the Government put down the money first; certainly no great improvement in the health of the community had ever been gained by that method. The other was to start by stimulating the enthusiasm of the profession, so that it did the pioneer work and left the matter of payment until later; and that was the way in which advance in medicine had always been gained. He did not think the scheme would mean any hardship for the general practitioner; the only people who need complain, so far as he could see, were the consultants. What some of them were afraid of was that certain lines of research and methods of treatment would be forced upon them, whereby a free and untrammelled individualism would be lost.

Dr. L. S. LUCKHAM (Salisbury) said that he came from a city of some 25,000 people, with a large country district contiguous, the latter containing villages of 200 or 300 inhabitants. It was very difficult to establish primary health centres which would meet the case of such a district. The most valuable thing would be to combine the county hospital with the primary centre, the two working together. He rather thought it had been forgotten that a great deal of hospital accommodation was taken up because homes were not suitable even for minor cases of illness.

Dr. E. J. MACLEAN (Cardiff), speaking as a member of the Welsh Consultative Council, said that there appeared to be some misapprehension with regard to the status of the Councils. They were advisory to the Minister and in no sense intended to replace the organised bodies of the profession. There was nothing in these councils which would interfere with the status of the British Medical Association. So far from having its functions replaced or undermined, the Association should be strengthened and made still more representative. The movement to bring the profession under State control was very active. Many people felt that in view of the administrative power which the profession possessed some such control was necessary, and the maximum amount of it would be gained through a State medical service. Turning to the reports of the English and Welsh Consultative Councils, he said that if they did in large part agree it was not the result of collusion, for the Welsh Council had deliberately kept away from the English body in order that the problems might be approached with an unbiassed mind. The Welsh Council was composed not only of members of the medical profession but of representatives of various public authorities, whose criticism was available on points as they arose. The Principality was compact, and thus visits could be paid to representative areas—that is, purely rural areas, mixed areas, and densely populated industrial areas—and certain principles had been applied as the result of their acquaintance with those three sets of conditions. The present stage, he thought, was not one for much criticism, but there would come a time when very critical and contentious issues would have to be faced.

Dr. C. E. S. FLEMMING (Bradford-on-Avon) said that the profession had had placed within its grasp what it had been fighting for for years—namely, the opportunity to do its work properly. But there was a fear that the independence of the individual practitioner was threatened, and, while independence from every sort of control was impossible, it should be limited to intra-professional control. With regard to the relation of the general practitioner to preventive medicine, he would like to see every medical man given more powers approximating to those of a medical officer of health—powers to advise, report, and suggest—because no man was better able to make an effective medical officer of health than the general practitioner. The primary health centre was the ordinary development of institutions and work already in existence.

The PRESIDENT, in closing the discussion, conveyed to Lord Dawson the thanks of the branch, and said that the views expressed might be summed up in the view that the profession feared organisation being imposed upon it from without, and believed that the best way to meet the situation was to coördinate its work and prove its statesmanship.

Lord DAWSON, in reply, considered that the Consultative Council in no way usurped the present means of communication of the views of the profession. At the same time it did offer a nexus between the profession and the Minister. The Council, although nominated by the Minister, was absolutely independent. There seemed to be a fear amongst some speakers of the danger of State service or State control. But where some had pointed to individualism he saw only intellectual anarchy. If by individualism was meant absence of all control that was something which would not be good for the profession, and something which the community was not in the least likely to concede. He had to remind them again that State service was now coming. Various instalments of State service had already been set up. The report of the Council was not making for State service; it was the sole alternative. He agreed with what had been said about the dangers of bureaucratic control, but he had found no responsible person in the Government or Ministry of Health eager for such control. There would be no cast-iron health service organised from Whitehall. The Ministry of Health would be the inspirer, controller, and coördinator—that was all. He took it that subject to certain broad principles there would be considerable difference of detail in the various areas. Whatever the constitution of the local

health authority, they claimed that the medical profession as such must be represented upon it. A few broad-minded medical men would have an influence on such an authority far beyond their numbers. The majority of members must be elective, but in the coöpted minority the profession claimed to have a strong voice. He agreed that the profession must be adequately remunerated, but it would be a mistake to let it be supposed that pecuniary considerations occupied all their thoughts. He believed the general effect of a properly organised system would be to enhance the pecuniary position of the men who practised under it, and he did not believe that in most instances it would increase their work, although it would add enormously to the interest of the work.

Lord Dawson concluded by sympathising with the criticism which had come from sparsely populated areas, and said that the question of subcentres, and also of ambulances, had been considered by the Council, but had not yet reached the stage of definite proposals, in a report which was an interim document capable of indefinite adaptability. He deprecated the remarks of Dr. Gordon on the subject of Labour, as most intelligent views had been forthcoming from that quarter, and if a broad-minded scheme were hammered out he was sure that Labour would offer most unprejudiced assistance.

ROUMANIA.

(FROM OUR OWN CORRESPONDENT.)

Influenza Complicating the Ear and Upper Air Passages.

IN the spring of this year severe influenza epidemics have occurred in several parts of Transylvania, the numbers of cases even surpassing those of 1918. Dr. Muntean has studied the complications of ear and upper air passages and has just published a concise report. He considers first the relation of influenza to the ear, and states that it may affect either the inner ear, of the diseases of which little is known, or the middle ear, involving either the drum membrane alone or the entire middle ear—as first described by Dr. W. Hitschler in America. The disease differs from the ordinary otitis media in that in the early stages of the condition there is a marked tendency to hæmorrhage, which may be observed as punctate or diffuse ecchymoses on the tympanic membrane, or as bloody vesicles raised from its surface, sometimes extending beyond the membrane itself, and involving the postero-superior wall of the external auditory meatus. The pain is more severe and is more likely to be present on pressure over the mastoid, and the symptoms of tinnitus, deafness, and discharge are intensified. The mastoid is much more likely to be involved than in other conditions, and the external attic is often the subject of purulent inflammation. The diagnosis between this condition and severe simple acute inflammation is very difficult; the prognosis is less good, and the tendency to chronicity greater than in the latter. In the upper air passages, in addition to the usual catarrhal signs, there are frequently whitish-grey patches, due to necrosis, on the larynx and trachea. Hæmorrhage, in the shape of epistaxis or hæmorrhagic laryngitis, œdema of the larynx and pharynx, and abscesses of the larynx and thyroid gland have also been observed. The recurrent laryngeal nerve is frequently affected, and paresis of the soft palate is among the nervous symptoms. Dr. Muntean refers in his report to the tendency to sinus diseases in these cases, and also to the fact that, though many cases recover, there are a certain number which result either in chronic sinusitis or in a transmission of the infective process to the orbital or cranial cavities, with occasional fatal termination. A meningitis can be caused by an acute empyema of an accessory sinus; too often the ætiology is unsuspected, and it is forgotten that such cases are likely to occur in acute exacerbations of a chronic sinusitis brought about by some infective process such as influenza.

A Case of Chlorate of Potash Poisoning.

Dr. Papp reports an interesting case of poisoning from chlorate of potash. The patient, a woman, aged 32 years, purchased from a druggist a bottle containing 60 g. of chlorate of potash. Though the printed directions were to dissolve 1 tablespoonful in 1 kg. of water, the patient used the entire 60 g., and occasionally swallowed some of the solution. After finishing the bottle the patient complained of itching, and after four days her thighs, legs, ankles, forearms, wrists, and trunk were seen to be covered with innumerable reddish macules. There were also numerous petechiæ. There was no nausea, diarrhœa, or headache. The patient made a slow but uneventful recovery.

Radium in Cancerous Growths.

Dr. Offner recently showed five patients before the Medical Society of Bucharest, two having a cancerous ulcer at the inner angle of the right eye. The treatment began February, 1919; weekly sittings; duration one hour. The bromide of radium was used; improvement was noticed in both cases after every application. For some reason one of the patients discontinued treatment after six weeks, with the result that the condition became worse, and the edges of the ulcer, which were in a fair way of cicatrisation, reopened. Treatment was resumed, with the result that the ulcer, which had obstinately resisted treatment for five years, now healed completely. The third case was that of a cancer of the lip; treatment with radium resulted in a marked improvement. The fourth case was a cancer of the penis; result unsatisfactory on account of repeated attacks of pneumonia in an aged patient. The fifth case was that of a cancer of the breast, for which the patient was operated on twice—nine and three years ago. In this case applications were made three times a week, and after 26 sittings the tumour seems to have disappeared. The patient has regained perfect control of the shoulder-joint; the tumour was located under left clavicle.

Nervous Debility among the Working-classes.

Excellent facilities for the study of this subject are presented in one of the largest workmen's sickness insurance clubs, and Dr. Oltmann and Dr. Meer have recently made observations on the question. It was formerly believed that nervous debility was relatively rare among this class, but this conception must now be revised. The greater incidence may, of course, be due to the fact that the lower classes are now under more systematic medical observation—at least in Transylvania—than formerly, but the previous observers are rather inclined to the belief that it is produced by our changed social conditions. The work itself and the conditions under which it is performed are different, and are characterised either by greater excitement or by extreme monotony. The struggle for existence often induces longer hours of work, and another important rôle is played by the disparity which exists between the intellectual equipment of the workmen, especially in larger cities, and the small claim made thereon by their work. Thus the typesetters, often fairly well educated, pursue an occupation which is not only fatiguing but monotonous. Among workmen where manual labour is of such a nature as to be productive of some degree of enjoyment neurasthenic conditions are rarely to be found. The majority of cases were noted between 25 and 45 years of age—the age of introspection.

Typhoid Fever Epidemic in Children in Bessarabia.

In September, 1919, a localised typhoid fever epidemic broke out in three or four districts of Bessarabia, and Dr. Slivensky publishes now some remarks on the 210 cases observed by him. He says that his cases seemed to show a relation between vomiting and hæmorrhage; especially in cases in which vomiting existed from the first was hæmorrhage apt to occur. The appearance of the stools in very young children was not so characteristic as in adults, though in older children pea-soup stools often occurred. A preliminary constipation was shown to have no evil significance, as has sometimes been claimed. Rose spots occurred in 54 per cent. of all cases, and herpes in eight cases, though several of these had complications. The average duration of the fever was 14½ days, a much

shorter period than is usual in the adult. The usual parallelism between the pulse and the temperature was not present in very young children. The characteristic leucopenia was present, and the Widal reaction occurred in nearly all cases where it was tried sufficiently late. Relapses in children, especially in girls, were more frequent than in adults. The mortality in Dr. Slivensky's cases was 9·6 per cent., and was much more frequent in relapses than in original attacks. Bad hygienic conditions conduced generally to fatality.

Plague Epidemic in Constantinople.

On account of the great number of cases of plague in Constantinople the Bucharest Government has officially declared the disease epidemic in Constantinople. Passenger traffic and goods transport can be passed only through the Sulina Port, where every person arriving has to be quarantined for eight days.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Medical Strikes in Sickness Insurance Clubs.

THE economic fight between the profession and the sick clubs, or Krankenkassen, as our official compulsory panel clubs are termed, is going on constantly in spite of the nearly uniform outcome—victory of the profession. The clubs are, as a rule, not willing to give in voluntarily, but after a while they are compelled to do so. In a recent protracted and obstinate dispute in Salzburg the whole profession refused to treat the panel patients under the whole conditions; after five weeks the managing board of the Krankenkassa accepted the conditions of the profession—that is, 100 per cent. increase of rate of payment per visit, not per head as hitherto, also payment of rent and for mileage. During the dispute the patients of the club were treated on the same lines as private patients, and the club had to refund to its members their expenditure, which proved nearly ruinous to its funds. The outcome of this "strike" served not only as a stimulus to the profession in other districts, but also helped materially in the negotiations between the Government and the profession going on at present. It is intended to solve the question of adequate payment of medical work, having regard to the legitimate demands of the working-class. As the income of the latter has risen much above that of brain workers, the doctors as brain workers endeavour to admit only persons to the sick clubs whose income does not exceed a certain sum. Otherwise, private practice would actually disappear. It is, therefore, very important that the Government should learn by such a demonstration that the profession is capable of using its power if required.

Gratuitous Treatment in Out-patients' Departments.

A serious problem has been attacked by the Medical Organisation Committee of Vienna at a meeting dealing with the organisation of general and special hospitals. Owing to the enormously increased cost of running the hospitals, the treatment of other but really poor patients constitutes a serious loss of public money. Also, the profession loses large sums in the shape of fees by the fact that a large number of patients capable of paying are still directed by their medical advisers to hospitals, instead of being sent to private specialists. In an appeal to all practitioners, these facts are made clear and they are requested to abstain from helping abuse. At the same time they are furnished with a complete list of recognised specialists, so that they can select the man they deem best fit for their purpose. On the other hand, all specialists attending or controlling the out-patient departments are requested to be most careful in extending their help only to such patients as can satisfy them as to their real poverty. Stress is laid on the fact that all persons in public or municipal service should be excluded from gratuitous treatment in hospitals, as these corporations are bound to obtain medical help for their officials. Payment from out-patients should be accepted only in special instances, and only at the same rates as are demanded in private cases. The appeal mentioned above is being sent to all country doctors as well as to the directors of the minor hospitals of the provinces, and it is hoped that reasonable self-interest, as well as professional spirit, will bring about the required uniformity of action.

Dangerous Dyes in Black Cotton.

At a recent meeting of the Medical Society of Vienna Dr. Sachs demonstrated an excised forefinger (index) of a woman who had injured it some time ago with a thread of black cotton imported from Italy. Soon after this slight injury the finger became sore, boils and bullæ appeared, and ulceration ensued in spite of regular treatment. Necrosis followed, and the finger had to be excised. Examinations by bacteriologists and chemical exports showed that micro-organisms were not the cause of the pathological changes (only staphylococci were found), but that the chemical dye used in the process of manufacturing the cotton was responsible. The dye is known as "iceblack," a coal-tar dye; its necrosing effect was noticed some time ago, and is similar to the evil effects of the dye, with which the so-called ink pencil is charged. Special precautions in the process of colouring of industrial articles are therefore being urgently advocated.

Vienna, July 9th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Anti-hookworm Campaign.

THE Bengal Government have issued a review of the work of the anti-hookworm campaign in Bengal. Inquiries having shown the prevalence of hookworm infestation among the people of Bengal, the Government, towards the end of 1918, called together a conference of the Sanitary Board, members of District Boards, and representatives of jute and coal industries and other interests, and invited their advice as to the measures to be taken to fight against the disease. In accordance with the recommendations of the conference, Government appointed three special officers with subordinate staff to supervise and direct all operations. A year has now passed since their appointment; work was at first impeded by ignorant suspicion on the part of the natives, who imagined that it was part of the insidious scheme connected with the Rowlatt Act, and that persons suffering from disease would be discharged. This prejudice was gradually overcome and a high ratio of infestation has been detected, the percentage in one month being 75 in one mill and 92 in another. In another mill, of skilled artisans who mostly wore boots, 35 per cent. were found to be infected. During the first four months of this year 3112 persons were examined and 8·5 per cent. were found infected. Arrangements have now been made by the Anglo-Indian Jute Mill for work to be carried on by a special officer. Training has been given to subassistant surgeons of the Bengal-Nagpur Railway and the ordnance factories at Cossipur, Ishapor, and Dum Dum. The chief medical officer of the Eastern Bengal Railway is arranging for all sub-assistant surgeons in railway hospitals to be trained. The aim from the first has been to utilise Government staffs for the work and for training the local staff, so that the managing authorities of different concerns may take up anti-hookworm work themselves. It is impossible for Government to open laboratories at all the centres where they are needed, so those who will benefit most provide them at their own expense. In order to diffuse a knowledge of the disease, charts have been supplied to schools, for it has been realised that propaganda is the only way to make the people realise the seriousness of the disease. Persons suffering from hookworm, if willing to submit themselves, may be treated by trained assistant surgeons. Nearly a hundred different lantern slides illustrating the life-history of the hookworm and various aspects of preventive work have been prepared, and have been issued to various centres of work and to local authorities and

others interested in the campaign. The extension of the movement has, however, been impeded by difficulties in obtaining supplies of microscopes and other apparatus.

The Housing Problem in Calcutta.

At present the chief obstacle in the expansion of Calcutta is the difficulty experienced by building societies and companies in obtaining land and securing a firm title. It is evident that private enterprise is willing to take up the matter provided land can be obtained, so Government have decided to acquire land under the Land Acquisition Act on the behalf and at the expense of the companies.

The Leper Problem.

A gratifying feature of the report of the Mission to Lepers is the announcement of substantial subscriptions from Indian ladies and gentlemen. The need for asylums is great, as there are 150,000 lepers. Hitherto the funds have all come from England, but efforts to obtain money from the Indian public have met with great success recently. The whole population is concerned in the matter, as the pauper lepers are a serious menace to the community. This menace will be met if the Bill to amend the Leper Act becomes law and is efficiently administered.

Indian Hospital Corps.

With the approval of the Secretary of State an Indian Hospital Corps has been formed. It will combine with the Army Bearer Corps, the Army Hospital Corps, and all subordinate personnel of Indian station hospitals. The corps will consist of 10 divisions, corresponding to the divisions in India and Burma, the requirements of the frontier coming from No. 1 Company, those of Aden from No. 6 Company. Each company so formed will be administered by the D.D.M.S. or A.D.M.S. of the division concerned, and will be under the immediate command of an officer of the medical services, who for purposes of discipline and finance will be the commanding officer of the company.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments have been made:—Surgeon Commanders: E. C. Sawdy, to *Victory*, for Royal Naval Hospital, Portland; G. Gibson, to *Indus*, and K. H. Hole, to *Royal Arthur*; H. J. Chater and R. W. B. Hall, to *President*, additional, for temporary service at Medical Dept. and as assistants to M.D.G; and E. R. Townsend, to *Dolphin*.

Surg. Rear-Admirals G. T. Broatch, W. J. Colborne, and J. H. Stenhouse are placed on the Retired List at their own request.

Surg. Capt. G. T. Collingwood to be Surgeon Rear-Admiral.

ROYAL ARMY MEDICAL CORPS.

Major W. F. H. Vaughan is placed temporarily on half-pay on account of ill-health contracted on active service.

To be Captains:—Capt. C. C. G. Gibson (late R.A.M.C.), Temp. Capt. C. J. R. Hay, from Special Reserve. Captains, from Special Reserve: C. Armstrong, W. H. Dye, N. Cameron, J. Cullenan. Temporary Captains: A. W. Dennis, G. Fleming, K. M. Nelson, A. C. Taylor.

H. Cardin, late temporary Captain, to be temporary Captain.

Captains, from Special Reserve, to be Lieutenants, and to be temporary Captains: W. I. FitzG. Powell, W. O. Holst.

Capt. D. W. M. Mackenzie, late R.A.M.C., Special Reserve, and Hon. Capt. C. A. Hutchinson to be Lieutenants and to be temporary Captains.

Temp. Hon. Lieut. W. N. Richards to be temporary Honorary Captain.

Officers relinquishing their commissions:—Temp. Capts. (Acting Major) L. J. Spence and A. Fletcher (granted the rank of Major). Temporary Captains retaining the rank of Captain: D. McLaren, J. Buchanan, J. R. Fleming, L. D. Roberts, A. Vella, G. C. Berg, C. R. Worthington, W. L. Johnston, T. H. Edey, G. Taylor, G. O. Hempson, A. B. Coomber, D. J. Stokes, H. A. Whyte-Venables, P. H. Henson.

SPECIAL RESERVE OF OFFICERS.

Capt. P. W. Mathew relinquishes his commission and is granted the rank of Major.

Captains relinquishing their commissions and retaining the rank of Captain: P. N. Cook, W. Burridge, N. D. Ball.

TERRITORIAL FORCE.

Major (Bt. Lieut.-Col.) A. B. Harris resigns his commission and retains his rank, with permission to wear the prescribed uniform.

Capt. P. H. Mitchiner is seconded.

Capt. D. J. Scott resigns his commission and is granted the rank of Lieutenant-Colonel.

Capts. C. P. Brentnall, W. B. Keith, and J. R. B. Russell resign their commissions and are granted the rank of Major.

Capts. F. Tooth, C. Hibbert, L. Courtauld, W. T. Torrance, and W. R. H. Heddy resign their commissions and retain the rank of Captain.

TERRITORIAL FORCE RESERVE.

Surg. Major W. H. Cheetham (Yeomanry) resigns his commission and retains the rank of Surgeon Major, with permission to wear the prescribed uniform.

Capt. S. E. Whitnall resigns his commission and retains the rank of Captain.

INDIA AND THE INDIAN MEDICAL SERVICE.

Col. P. Carr-White to be Major-General.

Capt. E. G. Kennedy relinquishes the acting rank of Lieutenant-Colonel.

Dr. W. O'Brien Beadon, Principal of the Women's Medical College, Agra, goes on nine months' furlough. During her absence Dr. G. J. C. Campbell, W.M.S., will officiate. The services of Lieut.-Col. G. Tate are temporarily placed at the disposal of the Political and Foreign Department. Major J. G. G. Swan is officiating as Civil Surgeon, Lahore, and acting as Professor of Midwifery at the Medical College, in addition to his own duties. Col. L. J. M. Deas has been posted as Civil Surgeon, Ajmer, and Chief Medical Officer in Rajputana. Lieut.-Col. E. L. Perry has been posted to Madras. Major D. P. Gort, Civil Surgeon, Rajshahi, has been allowed privileged leave. Major J. T. Parkinson has been placed on the supernumerary list, but will continue to act as Assistant to the Civil Surgeon, Mussoorie. Lieut. F. W. Mathews, Superintendent, Central Prison, Naini, Allahabad, is appointed Civil Surgeon, vice Major Hogan, Civil Surgeon, placed on the supernumerary list, but will continue to act as Superintendent, Central Prison, Naini, Allahabad. Capt. P. B. Mills has been appointed Civil Surgeon, vice Capt. Robertson, relieved, but will continue to act as Superintendent, Central Prison, Fategarh. Capt. R. Hempbell, R.A.M.C., has been appointed to hold Civil Medical Charge of Raniket, vice Lieut.-Col. A. T. I. Lilly, R.A.M.C., in addition to his own duties.

DEATHS IN THE SERVICES.

Inspector-General of Hospitals Sir James Nicholas Dick, K.C.B., R.N., honorary surgeon to the King, at his residence, Bembridge, Isle of Wight, on July 12th, aged 89. As Assistant Surgeon during the Russian war in 1854–55 he served in the *President*, the flagship of Rear-Admiral Price, and was present at the attacks on Petropaulovski on August 31st and Sept. 4th, 1854, when he was specially mentioned for his care of the large number of wounded. Later, as surgeon, he served on the West Coast of Africa and as senior medical officer in charge of the naval forces and Indian troops. He was also senior naval medical officer during the Abyssinian war, 1867–68, and for his services was specially promoted to the rank of Fleet-Surgeon (Abyssinian medal). During the Civil War in Spain, when Fleet-Surgeon of the *Lord Warden* flagship, in 1873, he proceeded into Cartagena during the bombardment as a volunteer to assist the wounded, and received from the Admiralty an expression of their high estimation of the zeal, energy, and skill shown by him in the performance of his duties in connexion with the R.N. Hospital, Malta, of which he was the principal officer during the Egyptian campaign, 1882. On the occasion of the celebration of the completion of the fiftieth year of Queen Victoria's reign he received the C.B. and was Director-General of the Medical Department of the Navy from 1888 to 1898. He became a K.C.B. in 1893.

URBAN VITAL STATISTICS.

(Week ended July 10th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had declined from 13·8 to 9·9 in the eight preceding weeks, was again 9·9 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·6, or 0·6 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 4·5 in Rotherham, 5·1 in Croydon and in Swindon, and 5·2 in Wimbledon and in Edmonton, to 16·9 in Swansea, 17·0 in Burnley, and 19·7 in Wigan. The principal epidemic diseases caused 192 deaths, which corresponded to an annual rate of 0·6 per 1000, and comprised 71 from infantile diarrhœa, 48 from measles, 31 from diphtheria, 22 from whooping-cough, 14 from scarlet fever, and 6 from enteric fever. Measles caused a death-rate of 1·8 in Northampton and in Wigan, but the mortality from the remaining diseases showed no marked excess in any of the towns. There were 1755 cases of scarlet fever, 1599 of diphtheria, and 2 of small-pox under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1705, 1603, and 3 respectively at the end of the preceding week. The causes of 33 of the 3367 deaths in the 96 towns were uncertified, of which 4 were registered in London and 3 in Birmingham.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 13·3, 11·5, and 11·1 in the three preceding weeks, rose to 12·1 per 1000. The 227 deaths in Glasgow corresponded to an annual rate of 10·6 per 1000, and included 8 from infantile diarrhœa, 6 from measles, 2 from whooping-cough, and 1 each from enteric fever, small-pox, scarlet fever, and diphtheria. The 84 deaths in Edinburgh were equal to a rate of 12·8 per 1000, and included 3 fatal cases of diphtheria.

Irish Towns.—The 113 deaths in Dublin corresponded to an annual rate of 14·2, or 0·9 per 1000 above that recorded in the previous week, and included 5 from whooping-cough and 3 each from measles and infantile diarrhœa. The 104 deaths in Belfast were equal to a rate of 13·1 per 1000, and included 5 from infantile diarrhœa, 2 from whooping-cough, and 1 from enteric fever.

VITAL STATISTICS OF LONDON DURING JUNE, 1920.

IN the accompanying table will be found summarised statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious disease, it appears that the number of persons reported to be suffering from one or other of the ten diseases notified in the table was equal to an annual rate of 6·0 per 1000 of the population, estimated at 4,358,309 persons; in the three preceding months the rates had been 7·1, 6·7, and 6·3 per 1000. Among the metropolitan boroughs the lowest rates from these diseases last month were recorded in Kensington, Hampstead, Stoke Newington, the City of London, Battersea, and Camberwell; and the highest in Finsbury, Shoreditch, Bethnal Green, Stepney, and Poplar. The prevalence of scarlet fever was slightly greater than in the preceding month; this disease was proportionally most prevalent in Chelsea, Hackney, Shoreditch, Bethnal Green, Stepney, and Poplar. The Metropolitan Asylums Hospitals contained 1674 scarlet fever patients at the end of the month, against 1981, 1795, and 1671 at the end of the three preceding months; the weekly admissions averaged 251, against 240, 223, and 228 in the three preceding months. Diphtheria was somewhat less prevalent than in the preceding month; the greatest prevalence of this disease was recorded in Paddington, St. Pancras, Shoreditch, Bethnal Green, Poplar, Deptford, and Greenwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1964, 1937, and 1783 at the end of the three preceding months, further fell to 1590 at the end of June; the weekly admissions averaged 189, against 260, 221, and 214 in the three preceding months. The prevalence of enteric fever was slightly less than in the preceding month; of the 31 cases notified during the five weeks ended July 3rd, 6 belonged to Wandsworth, 3 to Stepney, 3 to Poplar, and 2 each to Kensington, Hammersmith, Fulham, St. Marylebone, and Islington. There were 19 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 38, 29, and 18 at the end of the three preceding months; the weekly admissions averaged 3, against 6, 4, and 3 in the three preceding months. Erysipelas was proportionally most prevalent in Paddington, St. Marylebone, Finsbury, Bethnal Green, Poplar, Southwark, and Woolwich. The 11 cases of cerebro-spinal meningitis included 3 in Stepney and 2 in Wandsworth, while the 3 cases of poliomyelitis belonged respectively to Islington, Holborn, and Finsbury. The mortality statistics in the table relate to the deaths of civilians actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the five weeks ended July 3rd the deaths of 4259 London residents were registered, equal to an annual rate of 10·3 per 1000; in the three preceding months the rates had been 17·6, 15·4, and 12·4 per 1000. The death-rates ranged from 8·0 in Woolwich, 8·3 in Chelsea, 8·7 in Hammersmith, 8·8 in Wandsworth, and 8·9 in St. Pancras, to 11·5 in the City of Westminster, 11·6 in Islington, 11·8 in Southwark, 12·0 in the City of London, 12·6 in Finsbury, and 13·7 in Holborn. The 4259 deaths from all causes included 273 which were referred to the principal infectious diseases; of these, 66 resulted from measles, 10 from scarlet fever, 65 from diphtheria, 48 from whooping-cough, 4 from enteric fever, and 80 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded last month in Holborn. Among the metropolitan boroughs the lowest death-rates from these diseases were recorded in St. Marylebone, Stoke Newington, Wandsworth, Deptford, and Lewisham; and the highest in Chelsea, Finsbury, Shoreditch, Poplar, and Battersea. The 66 deaths from measles were 76 below the average number in the corresponding period of the five preceding years; this disease was proportionally most prevalent in Chelsea, the City of London, Southwark, Bermondsey, and Battersea. The 10 fatal cases of scarlet fever were 3 fewer than the average. The 65 deaths from diphtheria exceeded the average by 22; the greatest proportional mortality from this disease occurred in Fulham, Islington, Finsbury, Shoreditch, and Poplar. The 48 fatal cases of whooping-cough were 26 fewer than the average; this disease was proportionally most fatal in Paddington, Hampstead, Bethnal Green, Poplar, Camberwell, and Greenwich. Four deaths from enteric fever were registered during the month, against an average of 8; of these deaths, 2 belonged to Stepney. The 80 fatal cases of infantile diarrhœa were 20 in excess of the average; the greatest proportional mortality from this disease occurred in Chelsea, Islington, Finsbury, Shoreditch, Poplar, Southwark, and Lambeth. In conclusion, it may be stated that the aggregate mortality in London during June from these principal infectious diseases was 19·7 per cent. below the average in the corresponding period of the five preceding years.

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JUNE, 1920.

(*Specially compiled for* THE LANCET.)*

CITIES AND BOROUGHS.	Estimated civil population, 1919.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.									Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,358,309	—	1254	972	—	31	1	30	191	11	3	2493	6·0	—	66	10	65	48	4	80	273	0·7	4259	10·3
West Districts:																								
Paddington	143,938	—	18	37	—	1	—	1	10	—	—	67	4·9	—	4	—	1	3	—	3	11	0·8	132	9·6
Kensington	157,886	—	37	26	—	2	—	1	4	—	—	70	4·6	—	3	1	1	—	—	3	8	0·5	159	10·5
Hammersmith ...	130,981	—	30	27	—	2	—	—	4	—	—	63	5·0	—	1	—	1	1	—	3	6	0·5	109	8·7
Fulham	152,543	—	51	25	—	2	—	2	9	1	—	90	6·2	—	1	—	5	2	—	3	11	0·8	152	10·4
Chelsea	60,573	—	22	7	—	—	—	1	3	—	—	33	5·7	—	2	1	1	—	—	2	6	1·0	48	8·3
City of Westminst'r	127,533	—	40	19	—	1	—	—	5	—	—	65	5·3	—	1	1	—	—	1	2	5	0·4	141	11·5
North Districts:																								
St. Marylebone ...	97,953	—	30	10	—	2	—	—	7	—	—	49	5·2	—	1	—	1	1	—	—	3	0·3	97	10·3
Hampstead	88,012	—	27	6	—	—	—	—	3	1	—	37	4·4	—	1	—	—	3	—	—	4	0·5	84	10·0
St. Pancras	219,434	—	61	61	—	—	—	1	8	—	—	131	6·2	—	1	1	3	1	—	3	9	0·4	188	8·9
Islington	323,034	—	57	85	—	2	—	—	13	1	1	159	5·1	—	5	—	11	3	—	8	27	0·9	360	11·6
Stoke Newington...	50,954	—	7	10	—	—	—	—	3	—	—	20	4·1	—	1	—	—	—	—	—	1	0·2	46	9·4
Hackney	216,736	—	77	34	—	1	—	2	2	—	—	116	5·6	—	2	—	4	2	—	4	12	0·6	192	9·2
Central Districts:																								
Holborn	38,156	—	13	5	—	—	—	—	—	1	1	20	5·5	—	—	—	—	—	—	—	—	—	50	13·7
Finsbury	75,291	—	12	19	—	1	—	—	18	—	1	51	7·1	—	1	—	4	—	—	2	7	1·0	91	12·6
City of London ...	13,893	—	—	2	—	—	—	—	—	—	—	2	1·5	—	1	—	—	—	—	—	1	0·8	16	12·0
East Districts:																								
Shoreditch	98,134	—	46	42	—	—	—	—	4	—	—	92	9·8	—	—	—	4	1	—	4	9	1·0	104	11·1
Bethnal Green ...	110,085	—	74	44	—	1	—	—	9	—	—	128	12·1	—	3	—	1	3	—	—	7	0·7	110	10·4
Stepney	232,506	—	103	53	—	3	—	1	9	3	—	172	7·7	—	5	1	3	4	[illegible]	5	20	0·9	245	11·0
Poplar	153,644	—	64	44	—	3	—	4	10	—	—	125	8·5	—	4	—	3	7	—	9	23	1·6	161	10·9
South Districts:																								
Southwark	179,971	—	57	36	—	—	—	3	12	—	—	108	6·3	—	6	—	3	1	—	5	15	0·9	203	11·8
Bermondsey	124,239	—	38	24	—	1	—	1	—	—	—	64	5·4	—	5	1	1	1	—	2	10	0·8	134	11·2
Lambeth...	282,322	—	80	71	—	1	—	5	11	1	—	169	6·2	—	6	1	2	2	—	7	18	0·7	305	11·3
Battersea	159,316	—	25	33	—	—	—	2	6	—	—	66	4·3	—	6	1	2	3	—	3	15	1·0	150	9·8
Wandsworth... ...	333,693	—	106	76	—	6	1	1	10	2	—	202	6·3	—	1	1	6	—	—	2	10	0·3	281	8·8
Camberwell	273,802	—	53	53	—	1	—	4	9	—	—	120	4·6	—	3	—	5	6	1	4	19	0·7	252	9·6
Deptford...	111,205	—	29	29	—	—	—	—	5	—	—	63	5·9	—	—	—	1	—	—	2	3	0·3	103	9·7
Greenwich	98,484	—	33	27	—	—	—	—	2	—	—	62	6·6	—	1	—	—	2	—	1	4	0·4	92	9·7
Lewisham	167,754	—	44	33	—	—	—	1	6	1	—	85	5·3	—	—	—	1	—	—	1	2	0·1	149	9·3
Woolwich	135,237	—	20	34	—	1	—	—	9	—	—	64	4·9	—	1	1	1	2	—	[illegible]	7	0·5	105	8·0
Port of London ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

Correspondence.

"Audi alteram partem."

PELLAGRA.

To the Editor of THE LANCET.

SIR,—In an article on pellagra which appeared in your issue of May 8th last Dr. J. I. Enright criticises certain of the data and findings of the committee which, in 1918, investigated an outbreak of that disease amongst prisoners of war in Egypt. This reply, commenced long since and delayed by stress of military duty, is prompted by a wish to establish facts rather than to promote controversy. It is due, perhaps, to the present interest in this important subject; and certainly to the collaborators, especially Professor W. H. Wilson, with whom the "biological protein theory" of pellagra ætiology originated, who rendered Professor F. D. Boyd and me such invaluable aid in this investigation in Egypt.

The point at issue is, fortunately, quite definite. The committee's finding was that "lack of sufficient biological value of protein (in food) stands in ætiological relation to pellagra, certainly as an exciting factor and possibly as the determining factor. The deficiency ..... may be (*a*) absolute ..... or (*b*) relative, as determined by individualistic correlation between food assimilation and energy expenditure ..... ." Dr. Enright maintains that he finds evidence "sufficient to explode the food-deficiency theory as a predisposing factor" in the fact that pellagra occurred among German prisoners whose "diets both before capture and during their period of captivity ..... were ample, both in quantity and quality, for any possible requirements."

It is a matter of keen regret to the committee that, as the first German case occurred ten days after they had reported their findings and dispersed, they thus had no opportunity of investigating these cases. It is, however, possible to apply to the diets quoted the "critical analysis" which is invoked in support of the conclusion that they were in all respects adequate. Happily the critic himself supplies sufficient material to prove that they were not adequate.

(*a*) *The Pre-capture Diet.*

Full details of the diet quoted were obtained from one prisoner. As regulations prescribe that all prisoners must be deprived of all official papers as soon as possible it may be assumed that these details were given from memory, and are devoid of documentary confirmation. Dr. Enright lays stress upon the great intelligence of these German prisoners, but he pays that intelligence a doubtful compliment by supposing that they—longing for "the flesh-pots of Egypt," and being asked to compare their former and present diets—were likely to make any other reply than that they had been "living on the fat of the land." Which land? At that time the food shortage in Central Europe was acute; in Palestine the Turks were so underfed that from August to November, 1918, the rations of one unit provided an average of only 2214 calories per diem (documentary evidence); while, despite all our resources, we had to reduce the rations of our troops by 10 per cent. Yet we are seriously asked to believe that 7000 Germans, serving from front to base alongside half-starved Turkish armies with demoralised transport, in a land foraged during nearly four years of war, were receiving a daily *ration* containing (in addition to purchased eggs) protein averaging 168 g. and with an extraordinarily high maximum of 194 g., while all that we were then able to give our troops was 108 g. for Indian and 112 g. for European troops. Surely the faith in German veracity which can build a scientific argument upon such evidence as this is beyond the ordinary mortal. Upon closer examination the quoted ration bears intrinsic evidence of its own improbability; it is difficult to conceive that scientific Germans, late in the war, should include under one heading of alternative issues articles of such totally diverse values as cheese, butter, and jam.

Finally, Dr. Enright throws an interesting light upon his opinion that their diets "were ample ..... for any possible requirements" by mentioning that two of these German prisoners were found to be suffering from scurvy. It is certainly most remarkable that men receiving a daily ration of "453 g. fresh vegetables, or 226 g. of beans, peas, rice, or potatoes, and 350 g. fresh meat," supplemented as indicated by the statement that there was "certainly no lack of fresh fruit in Palestine and Syria during the enemy occupation," should develop scurvy. Among all the diseases which they might have got, these two cases were so inconsiderate as to acquire the particular one most fatal to the contention that they were perfectly fed. Criticisms which contain such conclusive evidence in their own despite must surely be rare.[1]

There are, however, few of the cases whose pre-pellagrous period of captivity is stated which require that a pre-capture food-deficiency, however probable, need be even assumed. From Dr. Goldberger's scientific experiment, and our experience in the outbreak of pellagra among Armenian refugees in Egypt, it appears legitimate to conclude that the antecedent food-shortage period coincided with that during which these German pellagrins were in captivity. The following table shows that this applies to 70 per cent. of the cases quoted:—

Month of captivity.	Onset of pellagra symptoms.	Month of captivity.	Onset of pellagra symptoms.
1st	No cases.	5th	13 cases } 70%
2nd	No ,,	6th	9 ,, }
3rd*	2 ,,	7th	5 ,,
4th	3 ,,		

* 3rd week.

We may therefore next consider the evidence advanced that the German prisoners' diets preclude the possibility of pellagra being due to protein deficiency.

(*b*) *Post-capture Diets.*

Dietaries of camps and hospitals require separate consideration. As Dr. Enright lays special stress upon the two cases from Maadi Camp, that issue is readily accepted first.

(i.) *In camps.*—This camp, situated amongst cultivated lands close to the Nile, was visited by the committee on Nov. 28th, 1918, with special reference to the fact that no German case had been reported there, while the adjacent Turks had provided 60 pellagrins in the preceding two months, thus providing the M.O.'s common to the two compounds with ample diagnostic experience. As no European case had occurred in Egypt when we wrote our report, we recorded our findings thus: "At Maadi over 2000 Germans, Austrians, and Bulgars have, for the last two years, occupied a compound immediately adjoining that occupied by some 6000 Ottomans. The occupants of both compounds have been living under similar conditions as regards water-supply and conservancy, equally exposed to biting insects and sunlight, and similarly protected against summer heat by matting sun-shelters, and against winter cold by two blankets and a great-coat per man. The only obvious difference was that of diet; the Ottomans lived upon their rations, while the Germans, being freely supplied with money through a consulate, supplemented their rations lavishly. During these two years no single case of pellagra had occurred among these Germans, Austrians, or Bulgars, nor was any suspicious case found on careful inspection by one of us (F. D. B.). This formed a most striking contrast to the 300 pellagra cases which had occurred during the present year from among the Ottomans—both Turks and Arabs—the great majority of whom had also been in captivity for long periods in this camp." I may add that Professor Boyd, whose diagnostic ability had been accentuated by great experience of pellagra in its very earliest stages, failed to find a single suspicious case in the sample batch (200, I think) of Germans examined there.

Careful investigation showed that practically the whole of the 2*s*. a day supplied to the Germans passed

[1] Since this was written this point has been anticipated by a communication, published in THE LANCET of July 3rd (p. 41), from Dr. J. Goldberger.

through the canteen accounts, and detailed study of those accounts provided the actual amounts of various foods sold. We were thus enabled to work out the *average* additions thus made to the ration. These diets may be thus compared:—

—	Protein.		Fats.	Carbo-hydrates.	Calories.
	B.V.P.*	Gross.			
Turks	39·1	92·0	27·55	515	2744
Germans, rations only	58·3	92·7	33·47	341	2087
,, rations and extras	89·7	144·3	120·67	458	3589

* B.V.P. is used here and subsequently as a useful abbreviation of "biological value of protein."

The Turks' unsupplemented ration afforded just under the "B.V.P." minimum of 40 g. per diem, as laid down by Professor Wilson. They became pellagrous in many instances.

The criticism regarding the German cases rests upon the assumption that their ration provided an adequate amount of protein, if any of them lived upon it alone. It is not easy to understand a critic missing the cardinal essentials underlying the word "relative" applied in our report to food deficiency. It appears strikingly obvious that—no matter what the protein intake may be—the tissues must suffer deficiency if their needed amino-acids fail to reach them because of being spent to make good a deficit in the total energy balance-sheet; income which is spent, as soon as received, on debt reduction will not serve to keep the recipient from starvation. The German ration provides 133 calories less than the 2200 daily expended by the average man "at rest"; that deficit is balanced by combustion of 32·4 g. of assimilated protein; the "B.V.P." available for supplying the tissues with amino-acids is thus reduced from 58·3 to 40·9 g. daily. This affords so slight a margin over the minimum of 40 g. as to render those Germans living wholly on their rations liable to loss of that trivial margin of safety by any trivial further disturbance of nitrogenous metabolism. Any lessening of protein assimilation (as by digestive disturbance) or any increase in energy output (as by exercise, cold, or individual bulk above the average) must suffice to reduce the available "B.V.P." below 40 g. and convert this ration into a diet such as, if long continued, we have found associated with the occurrence of pellagra.

Naturally this leads to the question of whether or not any of these Germans—and particularly these two pellagra cases—lived upon their rations. As Dr. Enright does not even mention so crucial a matter, one can only infer that it escaped his attention, and that a unique opportunity—such as can hardly recur—of establishing the precise diets of these two patients, and thus adding precise scientific data of obvious importance, was lost. Thus, again, probabilities have to be weighed; but in this case there is small room for doubt. It is only necessary to assume that 2 of 2224 prisoners in this camp lived upon their rations, and the whole criticism fails. The armistice, late in November, 1918, brought the possibility of transmitting money to Germany. It would, indeed, be remarkable if there were not, among 2224 men, two who hoarded their money allowance with a view to sending it home to their families. It would be no less remarkable if there were not here—as in the Turkish labour prisoners' camp—some inveterate gamblers who gambled away every cent. that they received. We are not even told whether the money was still continued to be supplied to these men, and the "critical analysis" invoked appears to have been in abeyance.

What applies to the German prisoners at Maadi also applies to those in other camps, and we are thus left with only the hospital diets to consider.

(ii). *In hospital.*—This concerns the cases cited as having been in hospital for other conditions for some considerable period before appearance of the diagnostic pellagrous rash. First it is noted that Dr. Enright refers to a "prodromal stage" in these cases, which preceded the rash by from 8 to 16 weeks, during which there occurred, among other symptoms, "obstinate diarrhœa ..... with passage of undigested matter," while "in some there was anorexia." During this period these patients thus ingested less, and lost more, protein; all had diarrhœa, and 9 of the 25 had dysentery. There was a further loss of assimilated protein, by indicanuria. In fact, it is evident that, as Dr. Enright puts it, "there was abnormal protein decomposition (in the bowel), and the ultimate good effects of the diet were largely vitiated or entirely lost in this manner."

This is most interesting as a corollary to results obtained by Professor Wilson and Captain H. E. Roaf by careful study of the nitrogenous equilibrium of a group of Turks selected by Professor Boyd, from a non-labour prisoners' camp, as free from any signs of pellagra. Their loss of nitrogen by malassimilation amounted to 33·6 per cent. of that ingested, as compared with 35·1 per cent. for definite pellagrins, and only 23 per cent. for what Professor Wilson's experience indicated as normal to the country. We also found that marked hypochlorhydria is one of the earliest features of established pellagra. The special interest of these findings lies in correlating them to the fact that such apparently healthy prisoners, selected (by pellagra experts) from volunteers in non-labour camps where many of them had been confined for long periods, became definitely pellagrous remarkably quickly (within three weeks in some instances) after transfer to labour camps. Whether these men were in the "prodromal stage," or were recurrent cases whose initial attack had been overlooked, it appears that malassimilation had so reduced their protein nutrition that they had become borderland persons, liable to become actively pellagrous on the least increase of energy expenditure sufficient to break down their precarious nitrogenous equilibrium.

If there be indeed in pellagra a "prodromal stage" during which protein assimilation is reduced in the manner suggested, and to the extent indicated by these clinical notes, then it follows that deficient biological value of protein in the diet must play a most important part in the progress of the case towards establishment of a vicious cycle, which, by the action and reaction of malassimilation and putrefactive diarrhœa, must eventually make recovery impossible.

It is thus apparent that in these hospital cases under consideration the adequacy of their diets cannot be considered apart from the factor of protein malassimilation and loss; in other words, they must have suffered a "relative" deficiency.

To the article under review we owe details which enable us logically to follow the indicated processes in the reverse direction consequent upon recovery of such patients as had not progressed to an irrecoverable stage. Checking of putrefactive diarrhœa initiated recovery: "If the stools became solid they gradually became better." If taken sufficiently early they recovered on the simple treatment of rest, which limited their energy output, and improved dieting. It is remarkable, further, that the items which Dr. Enright's experience led him especially to include in the increased diet should be those so especially rich in "B.V.P." as 7 oz. of meat and two eggs per diem.

To summarise: the disease is apparently cured if no other treatment be adopted than that of checking protein loss, lessening energy expenditure, and increasing protein intake, especially as regards its biological value of protein.

In conclusion, two other points may perhaps be referred to very briefly. The first is Dr. Enright's question as to why pellagra should not have occurred in the Central Powers during their food-shortage period of the war. In a report sent to the War Office by the D.M.S., Egypt, it is stated that "A few German Red Cross orderlies knew of the disease (pellagra), *having seen it in Austria.*" Moreover, we have the evidence of Dr. Kulz. I quote these as two items which have just chanced to come to my notice without my having had an opportunity to make any inquiries in this direction.

The last point is the very pertinent question—Why did not any of the many dysenteric, and other, cases among the British Forces of the B.E.F. who suffered from so marked a malnutrition become pellagrous? It

may be that a primary attack of pellagra only follows a long-continued deficiency in "B.V.P." such as these troops never experienced in the field, while the onset of wasting dysentery was so promptly met by rest in bed and appropriate milk diet that the malassimilation resulting was met from the outset by so complete a conservation of energy that relative insufficiency was not established. It must, however, be frankly admitted that this explanation is not convincing.

Is the deficiency factor only a contributory factor to a determining cause yet to find? If so, the suggestion that the latter is to be sought in an helminthic infection such as ascaris is equally difficult of acceptance, because the apparently healthy Turks were equally infected with the pellagrous, and the immune Indian troops were heavily infested by ascaris, if my recollection serves me well with regard to the findings of Major F. W. Stewart, I.M.S.

I am, Sir, yours faithfully,

P. S. LELEAN,

Lieutenant-Colonel, R.A.M.C.; Professor of Hygiene.

R.A.M. College, July 11th, 1920.

MEDICAL EXPERIENCES IN MACEDONIA AND THE CAUCASUS.

To the Editor of THE LANCET.

SIR,—Dr. Arthur Phear, in a lecture on his experiences in the East, which was given before the Royal Society of Medicine and published in THE LANCET of July 10th, refers to my observations on quinine which appeared in the *Journal of Hygiene* in October, 1919. Dr. Phear has given a condensed account of his experiences of various diseases, and a still more condensed abstract of my observations; in fact, he omits the essential points, but a relatively lengthy criticism follows. I showed that when quinine is injected intramuscularly, in concentrated or dilute solutions, it is absorbed with remarkable rapidity. At the end of two hours from the time of the injection the majority of the quinine has been removed. This was found to be the case in man, and in mules which were inoculated experimentally. This fact, which is of very great importance, is not referred to by Dr. Phear. The injection of any preparation of quinine into muscles, or subcutaneously, produces tissue necrosis which may be extensive. Animal experiments have shown that disasters will occur if the injections are not made correctly, and the complications which arise are, as would be expected, exactly those which are met with in the human subject. In my paper I have given a list of the complications which *did occur* among men injected intramuscularly with quinine, and some of these complications were of a very serious nature. Dr. Phear, apart from some cases of dysentery, never met with any serious complication. There are a very large number of others who will entirely agree with him, but, in my opinion, if it is fully recognised that serious troubles may arise unless the dangers, and how to avoid them, are fully understood, then quinine injections will not be regarded with apprehension. The remarkable fact that many thousands of injections of quinine were given during the war alone without mishap is great testimony to the recuperative power of the tissues. A distinguished member of the medical profession wrote to me in reference to my paper on quinine as follows: "No one should be allowed to inject toxic substances such as quinine into the tissues of his fellow creatures until he is fully acquainted with the dangers, which should be learnt by animal experiment."

I am, Sir, yours faithfully,

London, July 12th, 1920. LEONARD S. DUDGEON.

PHYSICAL ELEMENT IN PSYCHONEUROSES.

To the Editor of THE LANCET.

SIR,—I, like Dr. Judson Bury, "have been much impressed by the frequency with which relapses have occurred in cases which had been discharged from Maghull, Seale Hayne, and other neurological hospitals as either cured or improved," and I am glad to find that the medical profession is beginning to appreciate the folly of imaginin that it is possible permanently to cure psychoneuroses in a few minutes by suggestion, persuasion, &c. It *is* possible, and easy, it is also wise, to remove certain troublesome symptoms in this way; but it is not possible thus to replace suddenly the lost "ergogen" in the brain cells or to prevent relapse. All hysterical patients become also neurasthenic in time, unless their improvement by psychotherapy is confirmed into cure by country work and convalescence. At one period I could have sent away at a time 500 to 600 sufferers from war neuroses separately (and this is important) to light work in the gardens of England, Scotland, and Ireland; but the Government departments concerned were hoodwinked by the wonder-workers, the ten-minute curers, who misled themselves by not following up their cases, and dazzled the mental vision of the authorities by the evanescent brilliance of their immediate results.

Now that the Country Host Scheme has been taken over by the Red Cross and that private enthusiasm has diminished, I fear there is much difficulty in finding hosts, but I am still seeing very many neurasthenics who urgently need non-institutional convalescence and who probably will not recover permanently till they get it. Could not our country confrères persuade landed proprietors and others in their district to act as "hosts" to single neurasthenics, who would live with the gardeners for two or three months and work with the latter, not for pay but by way of treatment?

Any "host" willing to receive such a patient should communicate with the County Director, Red Cross (Country Host Scheme), 27, Grosvenor-place, London, S.W. 1. I am, Sir, yours faithfully,

THOMAS LUMSDEN.

South Eaton-place, S.W., July 9th, 1920.

THE TEACHING OF OBSTETRICS.

To the Editor of THE LANCET.

SIR,—In a leading article in THE LANCET for July 3rd it is stated that—

"We believe it is only the Universities of Oxford and Cambridge which require that the student shall actually receive practical instruction in lying-in wards before presenting himself for his examination in midwifery."

In the Calendar of the University of Leeds, 1919–20, p. 409 et seq., the regulations for candidates read thus:—

Hospital work—*In Obstetrics* (a) of *having attended during not less than one month the indoor practice of a Lying-in Hospital* or the Lying-in Wards of a general hospital approved by the University, and (b) having personally conducted not less than twenty cases of labour, &c. .....

For many years this rule has been complied with. Each student attends for one month and receives practical instruction at the Leeds Maternity Hospital (70 beds) before being allowed to attend cases in the district. I may add that arrangements are now being made to carry out the suggestions of the General Medical Council in a more complete manner than formerly possible. It may not be without interest to state that candidates for the final examination are required to undergo a clinical examination in gynæcology, and I think that this university was the first to carry this idea out some 12 or 15 years ago.

I am, Sir, yours faithfully,

E. OCTAVIUS CROFT,

University of Leeds, July 8th, 1920. Professor of Obstetrics.

THE BIOCHEMISTRY OF MICRO-ORGANISMS.

To the Editor of THE LANCET.

SIR,—The short report, appearing in THE LANCET of June 26th, of a paper on detoxicated vaccines which I read at the Brussels Congress (Royal Institute of Public Health) in May was misleading, and I should like to give a short résumé of my work, during the past two years, on the detoxication of vaccines, which has largely developed into a study on the biochemistry of micro-organisms. Whilst researching on the biochemical composition of germs I have carried out at the same time a parallel series of investigations on various tissues of animals and certain plants.

All bacteria are closely related in their biochemical composition to animal tissues, and consist largely of

protein substances. On the other hand, they differ materially from plant tissues in that they apparently contain no cellulose. My researches have shown that bacteria and animal tissues can be split up in the same manner into three main groups of substances—viz., alkali soluble material, acid soluble material, and alcohol soluble material. The relative proportions of the alkali, acid, and alcohol soluble fractions of different germs and animal tissues vary very greatly; for example, the gonococcus consists of 90 per cent. alkali soluble, 9 per cent. acid soluble, and 1 per cent. alcohol soluble substance, whereas the tubercle bacillus contains 40 per cent. alkali soluble, 30 per cent. acid soluble, and 30 per cent. alcohol and chloroform soluble material. No two germs give the same quantitative proportions and thus it is possible to diagnose a given germ by biochemical analysis alone without resorting to the microscope. The same is true of tissues. Brain tissue is remarkable in containing an enormous proportion of alcohol and chloroform soluble lipoid material (about 50 per cent.), whereas the alkali and acid soluble fractions are correspondingly low. Muscle tissue, on the other hand, is rich in alkali and acid soluble material and comparatively poor in alcohol soluble substance.

The quantitative biochemical analysis can be carried, however, much further, since it is possible to split up the alkali and acid-soluble fractions into subgroups. Thus, the alkali-soluble material may be subdivided further into (*a*) metaprotein, which is thrown out of alkaline solution on neutralisation with acid; (*b*) primary proteose, which is thrown out of the neutral solution by half saturation with ammonium sulphate; (*c*) secondary proteose, which is precipitated by full saturation with ammonium sulphate; (*d*) a brown material not precipitated either by full saturation with ammonium sulphate or absolute alcohol. This subdivision of the main groups makes it possible to separate the toxic fractions from each. When the metaprotein and proteoses are thrown out of solution by neutralisation, ammonium sulphate or alcohol, the toxic substance remains in the supernatant fluid. It can also be removed from the precipitates by simply washing the latter with alcohol or water or both.

In the case of the secondary proteose precipitates, which are largely soluble in water, the toxin must be removed by washing with absolute alcohol. The toxic material is light straw in colour when dilute and dark reddish brown, like port wine, when concentrated. It appears to be identical with the substances excreted in urine. It is well known that urine is toxic. In other words, it would appear that by this process of detoxication there is removed from the germs or tissues the same harmful and useless substances that are excreted by living animals in the urine. The brown toxic material, so far as I can ascertain, is not antigenic (produces no immunity). The other non-toxic fractions of the germs, on the other hand, are definitely antigenic (immunising), as estimated by the complement-fixation test and by inoculation experiments. The first detoxicated vaccines, which I described in THE LANCET of June 28th, 1919, were composed only of the alkali-soluble metaprotein part of the germs. Now I include in addition all the other antigenic fractions—viz., the proteoses, the acid-soluble and the alcohol-soluble lipoid portion, each of which is detoxicated separately. In other words, every part of the germ is now included except the actual endotoxins.

Another point of great interest is the fact that the preteoses have a provocative action. For example, the preteose fraction of the gonococcus when injected subcutaneously provokes a focal reaction at the site of the disease. In a disease like gonorrhœa this provocation does no harm and I include the proteoses in this vaccine because they are antigenic. In systemic diseases, however, like tuberculosis or pneumonia, it is doubtful if the proteoses of the tubercle bacillus and the pneumococcus should be included in the vaccines, since a provocative focal reaction in the chest in such conditions might be undesirable. At the present time I am endeavouring to ascertain whether detoxicated tubercle bacillus vaccine is better with or without the proteoses. With the vast majority of germs, detoxicated vaccines are some ten to one hundred times less toxic than ordinary vaccines. In the case, however, of the typhoid and coliform group of germs, the detoxication is not so marked. I am inclined to attribute this to the fact that the bacteria of this group have a very much higher percentage of proteoses in their composition than those of any other group so far examined.

I am, Sir, yours faithfully,

DAVID THOMSON,

New Cavendish-street, W., July 8th, 1920. Lecturer and Research Pathologist to the London Lock Hospital.

THE ILLNESS OF MR. CLIFFORD ALLEN.

To the Editor of THE LANCET.

SIR,—I enclose a statement by Mr. Bertrand Russell and myself on the illness of Mr. Clifford Allen while with the British Labour Delegation in Russia, to which I was attached as physician and secretary. Mr. Russell and I are anxious to have our own signed statement circulated because a matter of principle of first-class importance both to individuals and doctors emerges from it. Mr. Allen is getting better and is now on his way to England.

I am Sir, yours faithfully,

Tite-street, S.W., July 12th, 1920. L. HADEN GUEST.

ENCLOSURE.

British Labour Delegation to Russia and the Illness of Mr. Clifford Allen.

On May 30th, while the British Labour Delegation was on the Volga, Mr. Clifford Allen became suddenly ill with acute pleurisy and pneumonia originating from the latent phthisis from which he had suffered. Before the delegation left England for Russia, Mr. Allen was medically examined and was found in good health and free from any active disease, and had so remained free for one year. Mr. Allen was, therefore, considered fit to travel. During the four days after the beginning of the illness, during which the boat proceeded down the river to Saratoff, Mr. Allen became very gravely ill indeed, and Dr. Haden Guest warned the members of the delegation that his life was in great danger. It had been arranged that the delegation should return to Moscow by train from Saratoff. On arrival at Saratoff Allen had a hæmorrhage which made it dangerous to move him.

Three courses were possible with regard to Mr. Allen: (1) to leave him in a sanatorium in Saratoff; (2) to take him by train with the rest of the delegation to Moscow; (3) to let him remain on the boat and proceed with it to Astrakhan. To both of the first two courses there was the insuperable objection that he could not be moved on that day without danger to life, and as accommodation on the boat was comfortable, and there was a Russian doctor and a good Russian nurse attached to the boat, and food, especially milk, was more easily obtainable on the boat than in any town in Russia, as it was obtained directly from the villages en route, it was decided to keep Mr. Allen on the boat. The Russian doctor on board, Dr. Dmitrieff, agreed entirely with the decision which was arrived at—namely, that Mr. Allen should remain on the boat. We proceeded to Astrakhan and from there returned to Saratoff.

Mrs. Philip Snowden and Mr. Bertrand Russell remained with Dr. Haden Guest to help in the nursing. At Astrakhan Dr. Haden Guest called in a consultant, who took an even graver view of the case and regarded it as hopeless. Nevertheless, by the time the boat arrived at Saratoff Allen was sufficiently recovered to be moved and fit to travel as a lying down case. By the kindness of B. M. Sverdloff, Acting Minister of Ways and Communications, who had been on the boat throughout Mr. Allen's illness, a special saloon coach was provided and arrangements were made to enable Mr. Allen to remain in this coach until his arrival at Revel in Esthonia, as well as for accelerating his journey. Partly on account of the impossibility of communicating with his friends in Western Europe and partly for other reasons Mr. Allen so urgently desired to get to Revel, as to make it almost impossible for him to sleep or rest while in Russia. This gravely aggravated his condition and made his departure imperative on medical grounds.

On arriving at Moscow and presenting ourselves at the Foreign Office for visas, we learnt that the Government had decided to keep Mr. Allen in a sanatorium in Moscow pending a medical examination by doctors chosen by themselves. At first Ttchiterine was unwilling to allow this examination to take place immediately in the train, in spite of our both stating to him that we considered Mr. Allen's speedy departure of the utmost importance for saving his life. It was only after we had both made strong and formal protests against the Government decision, which we regarded as gravely increasing his danger, that Tticherine decided to

send the doctors to the train at once. Much as we regret having been forced into any unpleasantness, we think it necessary to state that we only adopted this method after we found that all milder methods were unavailing. Four doctors were sent to take part in the examination of Mr. Allen, of whom two, Professor Popoff and another, actually performed the physical examination.

Dr. Dmritrieff and Dr. Haden Guest were also present. After examination the professors entirely agreed with Dr. Haden Guest that Mr. Allen was fit to travel and visas of passports were issued during the night, the train leaving Moscow on the following day. At Revel arrangements were made by Dr. Haden Guest to have Mr. Allen removed to the Diakonisse Nursing Home, the American Red Cross lending their ambulance and the British Mission rendering every possible assistance.

The doctor at the nursing home at first took a very grave view of the case, but at the end of two days pronounced Allen out of immediate danger. During the first week of his stay at Revel Mr. Allen made rapid progress and is looked after by an English-speaking nurse, who will accompany him to England if he so desires.

(Signed) BERTRAND RUSSELL.
July 2nd, 1920. L. HADEN GUEST.

"PITUITRIN."

To the Editor of THE LANCET.

SIR,—Will you allow me to state that in the case of rupture of the uterus recently reported in THE LANCET from a paper I read before the Obstetrical Section of the Royal Society of Medicine I wrongly used the word "pituitrin" to designate the extract of pituitary gland which was employed. It has been pointed out to me that "pituitrin" is the name exclusively used for the product prepared by Parke, Davis, and Co., and in this particular case it was not the preparation of this firm which was administered.

I am, Sir, yours faithfully,
Harley-street, W., July 12th, 1920. ALECK W. BOURNE.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, JULY 7TH.

Small-pox in Glasgow.

Mr. WATERSON asked the Minister of Health if he would state how many cases of small-pox had occurred in the city of Glasgow this year.—Mr. C. D. MURRAY (Solicitor-General for Scotland) replied: The number of cases of small-pox in Glasgow up to July 2nd was 306.

Exhumation of American Soldiers.

Lieutenant-Colonel BUCKLEY asked the Minister of Health if bodies of American soldiers interred in the Liverpool district were being exhumed for transfer to America, and if so, would he state where these bodies were being recoffined and what arrangements were being made to avoid risk of infection.—Mr. SHORTT (Home Secretary) replied: The reply to the first part of the question is in the affirmative. These removals are being carried out by the United States military authorities with the aid of an expert staff, and with the most careful precautions against the possibility of any risk to the public health. The remains are thoroughly disinfected immediately on the coffin being opened, and are at once replaced in a metal case which is hermetically sealed. This takes place in the cemetery, and is completed in a very short time after the exhumation. I am satisfied that no danger to the public health need be entertained.

Chairman of General Nursing Council.

Mr. ALFRED DAVIES asked the Minister of Health whether he appointed the present chairman of the General Nursing Council set up under the Nurses Registration Act without consultation with the members of the Council, and if so, would he state his authority for this action.—Mr. ROBERT RICHARDSON asked the Minister of Health whether he was aware that the chairman of the General Nursing Council had neither experience nor knowledge of medical or nursing matters sufficient to enable him to understand and to guide the General Nursing Council in its deliberation on professional subjects.—Dr. ADDISON replied: The General Nursing Council has to prepare statutory rules to perform judicial functions in relation to the removal of unfit persons from the register, and in view of the amount of quasi-legal work devolving on them I thought it desirable to appoint a chairman with legal experience, and I was fortunate in being able to persuade Mr. Priestley, K.C., to accept this post. I was not under any obligation to consult the members of the Council, and I accept full responsibility for the appointment.

Refuse Dumps at Greenford.

Mr. MOSLEY asked the Minister of Health whether he would make immediate inquiries into the dumping of refuse from Marylebone by canal into the district of Greenford, Middlesex, in view of the fact that a swarm of rats and flies, attracted by this refuse, constituted a grave danger to the health of the inhabitants of Greenford.—Dr. ADDISON replied: I have already arranged to have these refuse dumps inspected at an early date.

The Finance Bill: Income-tax Relief to Foreign Invalids.

The House went into Committee on the Finance Bill, Mr. Whitley in the chair.

On Clause 23, which provides that no relief in respect of income-tax shall be granted to an individual resident outside the United Kingdom unless they can satisfy the Commissioners of Inland Revenue that they are (*a*) a British subject, (*b*) that they are or have been in the service of the Crown, or employed in the service of any missionary society or in the service of any native State under the protection of His Majesty, (*c*) they are resident in the Isle of Man or the Channel Islands, (*d*) have previously resided within the United Kingdom and are resident abroad for the sake of their health, or (*e*) that the claimant is a widow whose late husband was in the service of the Crown.—Mr. G. LOCKER-LAMPSON wanted to confine the operation of Paragraph (*d*) to persons of British birth. The Chancellor, he said, was apparently going to allow a person who was not of British birth, and who left the United Kingdom to go abroad for the sake of his health, to obtain relief. He did not see why relief should be given to a foreigner, who very likely went back to his own country.—Mr. BALDWIN (Financial Secretary to the Treasury) said he hoped that the amendment would not be pressed. He could quite understand his honourable friend's feelings, because many of them still felt that they did not want any of the advantages which were given to English people to be given to Germans, but this was not confined to Germans. There were genuine cases of people who had lived in this country for the best part or all their lives, who belonged to friendly and allied nations, and he did not think that they should take away from these people by Statute a privilege that was enjoyed by all others who were resident in this country, if and when the circumstances arose.—The amendment was negatived.

Eaton Hall Hospital, Chester.

Mr. ROBERT YOUNG asked the Secretary for War whether Eaton Hall, Chester, was now closed as a hospital; and whether he could state the number of officer patients in residence at the end of April and later monthly periods, along with the number of staff employed there at the end of each month since Dec. 31st last.—Mr. CHURCHILL replied: Yes, Sir. Eaton Hall is now closed as a hospital. The number of officer patients in residence on the dates mentioned was as follows: April 30th, 1920, 62; May 28th, 8; June 4th, nil. The staff employed was as follows: Jan. 4th, 1920, 108; Jan. 25th, 107; Feb. 29th, 110; March 28th, 88; April 25th, 83; May 30th, 41.

Women's Hospital, Clare Market.

Mr. ALFRED T. DAVIES asked the Minister of Health whether he was now in a position to announce the result of his representations to the authorities of the Sheffield-street Hospital for Women at Clare Market, W.C. 2, with reference to the appointment of two men doctors to the posts of medical officers and assistant medical officers, respectively, and to the desirability, admitted by the Ministry of Health, of appointing women to posts of this kind.—Dr. ADDISON replied: I have now been informed by the authorities of the hospital that the desirability of selecting women for posts of this character will receive special consideration in connexion with any future appointments.

Invalids' Flour.

Mr. WADDINGTON asked the Food Controller what was the method adopted in appointing grocers in Lancashire towns for the sale of white flour for invalids, and whether the number of these appointments had any regard to the population in the district; was he aware that in some towns of large population only one grocer was appointed, and this caused great inconvenience to those requiring the white flour; and would he make further appointments where reasonably required.—Sir W. MITCHELL-THOMSON (Parliamentary Secretary to the Ministry of Food) replied: The number of retailers specially authorised to supply imported flour under the Invalids' Flour Scheme has been determined with due regard to the population in each district, but the Minister of Food is prepared to make further appointments where representations justifying this course are made to him.

Tetanus in the Great War.

Mr. WATERSON asked the Secretary of State for War whether he could state the incidence of tetanus in the

recent war as regards wounded men brought to England, wounded men nursed in France or other parts of the continent, wounded men in Mesopotamia, and wounded men in Gallipoli and Egypt and other theatres of war, giving the attack-rate and the death-rate per thousand wounded in each case.—Mr. CHURCHILL replied: I regret that complete statistics are not yet available. For the period from August, 1914, to December, 1918, the number of cases of, and deaths from, tetanus reported in France, Belgium, and the United Kingdom among the troops wounded in France and Belgium gives approximately an attack-rate of 1·22 per 1000 and a death-rate of 0·49 per 1000. I have no figures at present regarding the incidence of tetanus in the other theatres of war mentioned, but I am informed that very few cases occurred in any of them.

MONDAY, JULY 12TH.

Indian Medical Service.

Sir W. JOYNSON-HICKS asked the Secretary for India whether he had arrived at any decision as to the future of the Indian Medical Service.—Mr. MONTAGU replied: I shall be in a position to decide on this question and to make an announcement when I receive the Government of India's recommendations on the Reports of the Army in India Committee (in so far as it deals with military medical organisation in India) and of Sir Verney Lovett's Committee on Medical Services in India. The two reports have to be considered together. Copies of the Lovett Committee's Report for publication are on their way to England, and I hope to publish the two Reports simultaneously very shortly. Meanwhile copies of the Report of Lord Esher's Committee have been sent to the Government of India, who will forward as soon as possible their views on both Reports. The following press communiqué was issued from the India Office on July 5th containing the revised rates of pay for the Indian Medical Service; also a copy of a letter which was sent to the British Medical Association on June 22nd dealing with the questions of pay allowances, pensions, passages, and leave reserve of the service, and the official status of the Director-General and Surgeons-General:—The Secretary of State for India, after consultation with the Government of India, announces the following increased rates of pay for regular officers of the Indian Medical Service, which take effect from Jan. 1st, 1920. The combined rates of basic pay and overseas allowance apply to all officers who were in the permanent service on Dec. 1st, 1918, and to all British officers who have joined or may join the service after that date. Indian officers who have joined or may join the service after Dec. 1st, 1918, will draw, as from Jan. 1st, 1920, pay in accordance with the basic scale set forth below, unless they are already drawing pay at a higher rate, in which case they will continue to enjoy the benefit of that rate for so long as they would otherwise have done; but they will not receive any further increment until it is due to them under the basic scale. The arrangements affecting Indians who join the service after Dec. 1st, 1918, are provisional. Exchange compensation allowance will not be admissible.

Rank.	Year of service.	Basic pay.	Overseas allowance.	Total basic pay and overseas allowance.
		Rs.	Rs.	Rs.
Lieut.	1	500	150	650
	2	500	150	650
	3	500	150	650
Capt. ...	4	650	150	800
	5	650	150	800
	6	650	150	800
	7	750	200	950
	8	750	200	950
	9	750	200	950
	10	850	200	1050
	11	850	200	1050
	12	850	200	1050
Major ...	13	950	250	1200
	14	950	250	1200
	15	950	250	1200
	16	1100	250	1350
	17	1100	250	1350
	18	1100	250	1350
	19	1250	250	1500
	20	1250	250	1500
	21	1500	250	1750
Lieut.-Col. ...	22	1500	250	1750
	23	1500	250	1750
	24	1600	250	1850
	25	1600	250	1850
	Over 25	1700	250	1950
	on S.L.	1850	250	2100

S.L. = Selected List.

Charge allowances and second-in-command allowances for station hospitals will be admissible in addition to the above rates of pay at the following rates:—

(a) *Charge Allowance.*

	Rs. per mensem.
1st class hospitals	240
2nd class hospitals	180
3rd class hospitals	120
4th and 5th class hospitals	nil.

(b) *Second-in-Command Allowance.*

	Rs. per mensem.
1st class hospitals	120
2nd class hospitals	90

Dated 5th July, 1920.

The following is the letter referred to:—

India Office, Whitehall, S.W.1., June 22nd, 1920.

SIR,—In continuation of this Department's letter of the 5th instant, No. M.4784, I am directed to address you on certain questions affecting the Indian Medical Service. The Secretary of State understands that in the course of interviews which have taken place between the Medical Adviser at the India Office, on the one hand, and the Chairman of the Naval and Military Committee of the Association and the Editor of the *British Medical Journal* on the other, the following proposals were put forward on behalf of the service:—

1. *Pay.*—The pay of officers to be calculated on the pre-war scale for charge of a regiment, but to be approximately 50 per cent. in excess of that.

2. *Allowances.*—(*a*) Allowances to be granted for the charge of Indian station hospitals. (*b*) Allowances not to be reckoned as part of the 50 per cent. increase, but as additional to it. (*c*) All existing general allowances paid to holders of professorial and bacteriological appointments and certain other special classes of appointments on the civil side to be maintained.

3. *Pensions.*—The same relative consideration to be given to officers of the Indian Medical Service as to combatant officers of the Indian Army. (The maximum for the Director-General, Indian Medical Services, being £1150 a year.)

4. *Passages.*—Officers of the Indian Medical Service in military employ to receive the same concessions in the matter of passages as combatant officers of the Indian Army. Officers of the Indian Medical Service in civil employ to receive the same treatment as officers of other Civil Services in India.

5. *Status of the Director-General and Surgeons-General.*—These officers to have the same rights as the Secretary to the Government in the matter of (*a*) direct access to the Viceroy or Governor, as the case may be; (*b*) access to documents, and opportunity of forwarding their views to the Viceroy or the Governor, as the case may be.

6. *Leave Reserve.*—The cadre of the Indian Medical Service to have a reserve of 25 per cent. for furlough, and 2½ per cent. for study leave, whenever this may be practicable.

Points 1 to 3 above have already been disposed of in this Department's letter of June 5th cited above, and the Secretary of State is about to make a public announcement, communicating the reorganisation of the pay of the Service.

As regards pensions, I am to refer you to the memorandum dated 3rd instant, issued by this Office, communicating the revised rates of pension for officers of the Indian Army and of the Indian Medical Service.

As regards passages, there has as yet been no decision on the question of passages for combatant officers, but the Secretary of State is willing to undertake that officers of the Indian Medical Service in military employ will receive the same advantage as those officers, and that those in civil employ will receive such concessions, if any, as may be granted to other offices in civil employ.

The Government of India reported in a despatch dated Feb. 26th that they had already agreed to the principle that the Director-General and Surgeons-General with provincial Governments should have the right to place their views direct before the Viceroy or Governor when necessary, and that they were then considering the best means of giving effect to that decision. In the meantime, the Secretary of State accepts point 5.

The Secretary of State undertakes to carry into effect the proposals for a 25 per cent. leave for furlough, and 2½ per cent. reserve for study leave, as soon as the strength of the Service permits.

I am, &c.,

(Sd.) S. F. STEWART, Deputy Secretary, Military Department.

The Medical Secretary, British Medical Association,
429, Strand, W.C.2.

Cost of National Health Insurance.

Mr. ROBERT YOUNG asked the Minister of Health whether National Health Insurance had cost since its inception £190,000,000, while benefits disbursed had only amounted to £24,000,000; and, if so, would he explain the reason for the cost of administration, and also say what was the amount of money remaining to the credit of the National Health Insurance Fund at the end of June or latest ascertainable period.—Dr. ADDISON replied: The total cost of National Health Insurance from its inception to Dec. 31st, 1919, was in round figures £190,000,000, the amounts paid in benefit and administration were £99,000,000 and £25,000,000 respectively, leaving a balance in reserve at that date of £66,000,000. The honourable Member in his figures has omitted the main cash benefits of the Act—namely, the sickness and disablement benefits.

Superannuation of Employees of Local Authorities.

Major HENDERSON asked the Minister of Health whether it was proposed to introduce a Bill this session dealing with the superannuation of employees of local authorities.—Dr. ADDISON replied: The matter to which my honourable friend refers is receiving consideration and proposals are being framed, but I cannot at present give a definite undertaking to introduce a Bill on the subject this session.

Fares of Hospital Out-Patients.

Mr. WATERSON asked the Minister of Transport if he could see his way to grant special reduced fares to people who were compelled to travel regularly to hospitals for treatment, and who now found the increased rate a terrible burden upon them.—Sir E. GEDDES replied: I regret that it is not practicable to grant reduced fares in such cases.—Mr. W. R. SMITH: Is the right honourable gentleman aware that in some of these cases it means three visits a week to a county hospital; that the very poorest people are involved; and that these high fares may be the means of depriving them of the medical treatment required to restore them to health?—

Sir E. GEDDES: I have the greatest sympathy with them, but in the present financial condition of the railways I cannot think that it would be right to subsidise any particular kind of journey at the expense of the taxpayer.—Mr. WATERSON: Would the right honourable gentleman consider individual cases brought to his notice?—Sir E. GEDDES: I shall be prepared to consider any case brought to my notice, but it is extremely difficult to say where you are going to make an exception.—Mr. WATERSON: Would not a doctor's certificate justify you?—No answer was given.

TUESDAY, JULY 13TH.

Conditions of Officers in R.A.V.C.

Colonel Sir ARTHUR HOLBROOK asked the Secretary for War if any decision had yet been arrived at with regard to the conditions of half pay for officers in the Royal Army Veterinary Corps; what steps were being taken to reduce the surplus strength of major-generals in the Royal Army Veterinary Corps; and whether he was aware that there were two such officers surplus to establishment whose retention was retarding the promotion of junior officers; if the two major-generals surplus to the Royal Army Veterinary Corps establishment were paid as and reckoned on the list of colonels on the establishment of that corps; and, if so, why did they not receive similar treatment as regards the conditions of half pay as other colonels on the establishment.—Sir A. WILLIAMSON replied: The two major-generals referred to by the honourable and gallant Member were promoted substantive major-generals for distinguished service. They are not surplus to the establishment of the Royal Army Veterinary Corps, but are holding appointments as colonels, which they would have filled if they had not been promoted. Their retention is not, therefore, retarding the promotion of junior officers. I do not understand what conditions of staff pay for officers of the Royal Army Veterinary Corps the honourable and gallant Member refers to, but if he will let me have fuller details I shall be happy to look into the matter further.

Inebriate Reformatories in Scotland.

Major MACKENZIE WOOD asked the Secretary for the Home Department whether any, and what, provision had been made to enable the powers conferred by Section 24 of the Inebriates Act, 1898, to be carried out; whether a habitual drunkard might be detained in a certified inebriate reformatory for a certain time; and what certified inebriate reformatories for male patients existed in the United Kingdom.—Mr. MUNRO (Secretary for Scotland) replied: There is at present in Scotland, to which the Section cited refers, one certified inebriate reformatory to which female patients may be committed under that Section. A habitual drunkard may, on conviction under the Section, be detained in a certified inebriate reformatory for a term not exceeding three years. In Scotland no certified inebriate reformatories for male patients at present exist.

Employment of Disability Pensioners.

Major COPE asked the Minister of Labour whether he was aware that there was a large number of men being discharged from hospital with a 30 to 40 per cent. disability pension and certified as fit for light work, who were unable to find employment; and, if so, would he state what steps, if any, were being taken, or were proposed to be taken, in such cases.—Dr. MACNAMARA replied: I am aware that in a number of cases the physical disabilities of disabled men make it extremely difficult to place them in suitable employment. The National Scheme, however, depends on employers being prepared to make sacrifices in the interests of disabled men by employing men whom they might not under ordinary circumstances think physically suitable, and I hope that with the extension of the King's Roll, many of these disabled men may be absorbed into industry. I would remind my honourable and gallant friend of our schemes for training disabled men under which, up to the present, we have trained 23,640; we have in training 24,048; and on our waiting list 22,445. I would add that in the training of these men we always keep in view their prospects of employment when training is completed.

DEATH OF DR. E. W. KERR, OF DORCHESTER.—Elias William Kerr, M.D., M.Ch. Dub., M.R.C.P. Irel., has died at his residence in Dorchester, in his seventy-first year. He was the eldest son of the late Rev. W. P. Kerr, D.D., rector of Hillfield. Dr. Kerr had practised for many years in Dorchester, where he had an extensive practice, and was highly esteemed in the town and district. In 1898 he was elected a member of the Dorchester Town Council, and was later made an alderman. In 1903 he became mayor of the town. He was also chairman of the sanitary committee. During the late war, Dr. Kerr assisted the medical officer at Colliton V.A.D. Hospital, and he also rendered medical assistance at the Prisoners Camp, Poundbury.

Medical News.

UNIVERSITY OF BRISTOL.—At examinations held recently the following candidates were successful:—

FINAL EXAMINATION FOR DEGREES OF M.B., CH.B.

Part II. (completing examination).—Thomas Henry Algernon Pinniger.

Part I. only.—William Harris Royal.

FINAL EXAMINATION FOR DIPLOMA IN DENTAL SURGERY.

Edward James Tucker.

EXAMINATION FOR DIPLOMA IN PUBLIC HEALTH.

Charles Herbert Hart, Stuart Hardy Kingston, and Arthur Denis Symons.

Part I. only.—Frederick Vaudrey Cant and Allan Dumbreck Fraser.

UNIVERSITY OF SHEFFIELD.—At examinations held recently the following candidates were successful:—

DEGREE OF M.D.

Lydia M. Henry and Lazarus Samuels.

DEGREES OF M.B., CH.B.

Final Examination.—Constance M. Chappell.

The degree of Ch.M. (ex-officio) has been conferred on the following: Percival Ellison Barber, Professor of Midwifery in the University of Sheffield; and Arthur Mayers Connell, Professor of Surgery in the University of Sheffield.

UNIVERSITY OF EDINBURGH.—At the graduation ceremonial, held in the M'Ewan Hall, Edinburgh, on July 8th, the following degrees were awarded:—

DOCTOR OF MEDICINE.

George Joseph Adams (in absentiâ), Peter Allan, *David Cuthbert Barron, Lawrence Dougal Callander, †Sydney Taylor Champtaloup, Duncan Cook, †Thomas Frederick Corkill, *James William Edington, Harry Evans, ‡George William Marshall Findlay, Andrew Walker Forrest, Henry James Craig Gibson, James Gossip, Thomas Pearson Herriot, William Nicol Watson Kennedy, James Lawson, William Ashley Lethem, ‡David Murray Lyon, William Farquhar M'Lean, *Francis George Macnaughton, Duncan James M'Rae (in absentiâ), James Robertson Menzies, George Nicholson, ‡Edwin Douglas Pullon (in absentiâ), Atholl Robertson (in absentiâ), James Alexander Richard Thompson, Claude Bartley Tudehope (in absentiâ), and *William Gifford Wyllie.

* Commended for thesis. † Highly commended for thesis.
‡ Awarded Gold Medal for thesis.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

Harry Alexander, Reginald Lund Baikie, Philip Barlow, George Shuttleworth Barnett, Richard Erstine Batson, Christiaan Frederik Beyers, Sam Borochowitz, Frederick George Harman Brown, Kenneth Stocks Brown, Henry Wallace Burne, Ronald M'Donald Cairns, Grace Sherwood Calver, Aidan Campbell, Helen Campbell (second-class honours), Harry Cohen, Dorothy Court, John Robert Crolius (in absentiâ), Montague Danziger, James Davidson, James Hamilton Dick, Margaret Laing Dobbie, Herbert John Cecil Durward (in absentiâ), Basil Algernon Gordon Archibald Edelston, Joseph Hayes Fairweather (second-class honours), Owen Fitzpatrick, Elizabeth Strathdee Forbes, Dora Williams Gerrard, Geoffrey M'Kay Gibbon, Mary Lindsay Gilchrist, James Allan Gillison, Michael Samson Goldberg, Jessie Gordon, Janet Grant (first-class honours), Arthur William Preston Haine, John Edgar Haine (second-class honours), Arthur James Cochrane Hamilton (second-class honours), Shankar Waman Hardikar, Christina Margaret Hawick, John Paton Hope, Jacobus Petrus Immelman, William Isbister, William Kantor, Eleanor Heald Kelly, Douglas James Ackworth Kerr, Ba Kin, Sydney Levey, James Alexander Law Loudon, Douglas Ian Otto Macaulay, James Fleming M'Conchie, Margaret Martin M'Dowall, Alexander Gordon MacGillivray, Agnes Mildred Macgown (second-class honours), Agnes Rose Macgregor (second-class honours), Henry MacKay, Florence Emily M'Kenzie, Jean Robertson Maclean, John McLeman, Jane MacLennan, Annie Sheila MacLeod (second-class honours), Jean Small Blair M'Neil, Philippus Bernardus Malherbe, Victor George Massie (in absentiâ), Robert M'Kie van der Merwe, Christian Balfour Fotheringham Millar (second-class honours), Christine Gardner Mitcheson, Donald John Morrison, Emily Marguerite Mure, Andrew Rowand Murray, David James Tosh Oswald, Anand Shridhar Paranjpé, William Patterson Petrie, Kenneth Maclennan Purves (first-class honours), Johannes Christian Rabie, Charles Barclay Reekie, Ruth Jean Deans Ritchie, Hera Ross, Annie May Roxburgh, Charles Wellwood Rubidge, Louie Antoinette Rubidge, Helen May Russell, Henry John Edward Schultz, Thomas Scott, Charles Shapiro, George Alexander Sinclair, William Arnold Sinclair, Philip Bradley Smale, Alice Barbara Stewart Smith, Dorothy Mary Smith, Thomas Sprunt (second-class honours), Ian Maclaren Thompson, Henry Thomson, Mabel Thomson, Marjorie Thomson (in absentiâ), David Livingstone M'Rae Tod, John Calvin Truter, Thomas Cleave Wakefield, Grace Walker, Edith Grace Wilkes, Apolina Anderson Wilson, and James MacLaren Young (second-class honours).

BACHELOR OF SCIENCE.

Department of Public Health.

Thomas Campion Lauder (in absentiâ).

DIPLOMA IN PUBLIC HEALTH.

George Arthur Borthwick, George Campbell (in absentiâ), John Dick, George Francis Palmer Heathcote, Wilhelmina Weir Hendry, Mary Pringle Hislop, Alexander John Pollock, Francis Benjamin Sutherland, and James Munro Tyrrell.

The following awards were also made:—

Faculty of Medicine.—Thesis Gold Medallists: George William Marshall Findlay, David Murray Lyon, and Edwin Douglas Pullon. Cameron Prize in Practical Therapeutics: Sir Robert Jones, K.B.E., C.B. Ellis Prize in Physiology: Robert John Stewart M'Dowall. Gunning Victoria Jubilee Prize in Materia Medica: Francis George Macnaughton. Ettles Scholarship and Leslie Gold Medal: Andrew Weir Davison. Allan Fellowship in Clinical Medicine and Clinical Surgery: Agnes Rose Macgregor. Freeland Barbour Fellowship: Helen Campbell, M.B., Ch.B. M'Cosh Graduate's and Medical Bursaries: David Livingstone M'Rae Tod. Beaney Prize in Anatomy and Surgery; Arthur James Cochrane Hamilton. Mouat Scholarship in the Practice of Physic: Henry Wallace Burne. Conan Doyle Prize: Sydney Levey. Annandale Gold Medal in Clinical Surgery: Arthur James Cochrane Hamilton. Buchanan Scholarship in Gynæcology: Janet Grant. James Scott Scholarship in Midwifery: Douglas Alexander Miller. Scottish Association for Medical Education of Women Prize: Janet Grant. Dorothy Gilfillan Memorial Prize: Janet Grant. Wellcome Medals in the History of Medicine: *Gold Medal*, Adam Cairns White; *Silver Medal*, Hilda Marion Davis. Pattison Prize in Clinical Surgery: John Murray Black. Wightman Prize in Clinical Medicine: Thomas Ferguson. Cunningham Memorial Medal and Prize in Anatomy: John Gray. Whiteside Bruce Bursary: Rennie Cooksey Burton and Margaret Christine Tod (equal).

UNIVERSITY OF ABERDEEN.—**The summer graduation** ceremony was held on July 8th, when the following degrees were conferred:—

DOCTOR OF MEDICINE.

Ernest William Henderson Cruickshank (honours for thesis), Hugh Ross Souper (honours), James George Copland, and John Lewis Menzies.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

*Annie Anderson, Emily Mary Badenoch, Isobel Campbell Brown, Enid Calder, Margaret Winifred Calder, Gertrude Elizabeth Cormack, Alan Alexander Duffus, John Bright Duguid, John Grant Elmslie, Vivian Leslie Ferguson George Matthew Fyfe, George Milne Gray, *James Christian Hall, Alexander Hastings, Robina Inkster, Helen Margaret Jardine, †Gertrude Helen Lendrum (second-class honours), Horatio David Low, †John Douglas McLaggan, *Annie Elizabeth Melvin, Matilda Fisher Menzies, *Marjory Mary Milne, *John Henry Mulligan (second-class honours), Frederic Dudley Ross-Keyt, Alisdair McIntyre Smith, Daniel Ironside Walker, Hiap Tock Wee, and Hilda Sutherland Young.

* Passed Final Professional Examination with distinction.

† Passed Final Professional Examination with much distinction.

The John Murray medal and scholarship were awarded to Dr. Young Garden Murray.

DIPLOMA IN PUBLIC HEALTH.

Alfred William Harper Cheyne, Edward James Clark, George William Elder, Thomas William Edward Elliott, Alexander Fowlie Fraser, George Alexander Connell Gordon, Alexander Johnstone, Sydney Walker Lund, Maggie Florence Jane Moir, John Skinner, James Lind Smith, John Herbert Stephen, John William Stephen, William Taylor, James Williamson Tocher, Burton Yule, and Vincent Thomas Borthwick Yule.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE, SCHOOL OF PHYSIC.—At examinations held recently the following candidates were successful:—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics; Jurisprudence and Hygiene; Pathology and Bacteriology.—Izak George Sacks (high marks), Charles Theodore de Mornet Villet (high marks), Theunis de Bruijn, Olive Victoria Fair and Jacob Hofman (equal), Robert Evatt Faussett, Max Elion, Isaac Cornick, Alice Elizabeth Lawlor, May Evelyn Powell, Abraham Agranat, Ruth Florence Flavelle, Gilbert Kirker, and Alida Charlotte Burt.

Pathology only (completing Examination).—Patrick Joseph Healy and Alfred Henry Norman Todd and Thomas Gerald Warham (equal), and John Douglas Thompson.

Part II., *Medicine.*—Eric Henry Cooke Allen (high marks), Maurice Nurock (high marks), William James Alexander Russell, Janie Millar Cummins, Olive Baile, Frederick Ziervogel van der Merwe, Eileen Hilda Dowse, Doris Louisa Graham, Essie Stuart Smyth, William Burton Fox, Edward Haslett Frazer, Johannes Cornelius Coetzee, Frederik Wynand Pienaar, William Richard Burns, and Frederick William Shegog.

Surgery.—Eric Henry Cooke Allen and William Theodore Micks (equal, high marks), Herbert Victor Exner and Francis Victor Small (equal, high marks), Adrian Johannes Louw Snyman and Frederick Ziervogel van der Merwe (equal, high marks), John Henry Brewell Crosbie, William James Alexander Russell, Philip Jabkovitz, Johannes Cornelius Coetzee, Edward Haslett Frazer, Johannes Philippus de Villiers, Moira Mary Brown, William Bernard Joseph Pemberton, Joseph Ballantyne Maguire, Bernard Moshal, Mervyn Edmund McBrien, and Frederik Wynand Pienaar.

Midwifery.—Elinor Dorothy Stopford, Thomas Falkland Litton Cary, William Bruce Briggs and Frederick William Shegog (equal), Charles William Parr, Francis Young Pratt, Edmund Cecil Smith, James Daly Leahy, Percival Israel Levitt, Frederik Wynand Pienaar and Richard Wood Power (equal), Donald Victor Latham, Mervyn Edmund McBrien and Constance McIlrath (equal), Nora Griffith, Patrick Joseph Healy, David John Browne, and James Alexander Smith.

MASTER IN SURGERY.

Isaac Whitla Corkey.

DIPLOMA IN PUBLIC HEALTH.

Part I., Bacteriology, Chemistry, Physics, and Meteorology.—Anna Mary Kathleen O'Halloran, Rupert Montgomery Gordon, Edward Lipman, Joseph Patrick Quinn, Eileen Gertrude Gwynn, James Wilfred McKinney, and Jessie Gilbert and Richard Edward Tottenham (equal).

Part II., Sanitary Engineering, Sanitary Inspection, and Report; Hygiene, Epidemiology; Vital Statistics; Public Health Law.—Charles Henry Comerford, Patrick Rock, Matthew Joseph Graham, Alfred Henry Price, John Francis Gaha, Rupert Montgomery Gordon and James Wilfred McKinney (equal), Richard Edward Tottenham, Charles Edward Pengelley, and Carlile Kelly.

QUEEN'S UNIVERSITY OF BELFAST.—**Of the 66** candidates—the largest number on record—who presented themselves last week for the Final M.B. of the Queen's University of Belfast, 52 passed. Mr. James S. Lee was first in medicine, Mr. F. M. B. Allen was first in surgery (Mr. James P. Martin was also awarded a special prize), and Mr. C. L. Broomhead was first in midwifery. Each of these first prizes in the main groups of medicine, surgery, and midwifery, is of the value of £30. Mr. Broomhead and Mr. Allen divided a prize of £20, being equal as first in all the subjects combined.

UNIVERSITY OF LIVERPOOL.—**At recent examinations** for the Diploma in Public Health the following candidates were successful:—F. A. Belam, J. Cullen, Constance M. Edwards, A. V. Glendenning, H. Middleton, S. R. Richardson, R. Rimmer, A. A. Turner, and J. Walker.

UNIVERSITY OF BIRMINGHAM.—**The Degree Congregation** was this year held in the Great Hall of the University on July 10th for the first time since 1914. In the intervening years the University formed the 1st Southern General Hospital with 1600 beds, and the Great Hall itself became the largest ward in England. The degrees were conferred by Sir Gilbert Barling, the Vice-Chancellor; 16 men and women were presented for the degrees of M.B., Ch.B., one man received the M.S., and one woman the M.D.

An elaborate scheme for post-graduate lectures to occupy a fortnight, beginning July 5th, had been arranged, but unfortunately the response was unsatisfactory, and for several of the sections the number of applications was too small to justify the holding of the lectures. Few practitioners were found able to give up the time necessary and the season was probably also unsuitable. The applications for the Sections of Medicine, Diseases of Children, Physiology, Radiology and Electrical Treatment, however, enabled these to be proceeded with. In the Section of Medicine Dr. O. J. Kauffmann gave lectures and demonstrations on the Diagnosis of Nervous Diseases, Dr. W. H. Wynn on the Diagnosis and Treatment of Pulmonary Tuberculosis, Drs. J. G. Emanuel and K. D. Wilkinson on Modern Methods in Heart Disease. The Section of Diseases of Children was conducted by Dr. Douglas Stanley, Dr. L. G. Parsons, and Mr. Bertram Lloyd. Professor E. W. Carlier discussed certain problems of Internal Secretion in the Section of Physiology, and Dr. H. Black gave a series of demonstrations on Radiology.

THE **Royal Statistical Society has opened a** register of the names of persons eligible for statistical posts. The society has often been asked to recommend qualified statisticians and has taken this means of bringing those who have appointments to offer into touch with suitable applicants. A list of names and qualifications will be furnished on application to the Secretary, at 9, Adelphi-terrace, London, W.C. 2.

MINISTRY OF PENSIONS: HONORARY CONSULTANTS.—The following physicians and surgeons, in addition to those whose names have already been announced, have consented to act as honorary consultants to the Ministry of Pensions:—

Honorary Consultants in Cardio-vascular Cases.

J. E. McIlwaine, M.D., R.U.I., D.P.H., Ulster Region.
H. J. Starling, M.D. Lond., D.P.H., Eastern Region.
Carey Franklin Coombs, M.D. Lond., F.R.C.P., S. Western Region.
T. Wardrop Griffith, M.D. Aberd., F.R.C.P., Yorkshire Region.
Wm. Errington Hume, M.D. Camb., F.R.C.P., Northern Region.
John Hay, M.D. Vict., F.R.C.P., North-Western Region.
Dr. Thos. Mather Thomson, L.R.C.P. & S. I., Ireland South Region.
William Thos. Ritchie, M.D. Edin., F.R.C.P., Eastern Portion of Scotland Region.
John M. Cowan, M.D. Camb., D.Sc. Glasg., Western Portion of Scotland Region.

Honorary Consultants.

Sir James Dundas Grant, F.R.C.S. Eng., Honorary Consultant in Aural Diseases to the Ministry.
Hugh Maclean, M.D. Aberd., D.Sc. Lond., Honorary Consulting Physician to the Ministry.
Sir Robert W. Philip, M.D., F.R.C.P. Edin., Honorary Consulting Physician in Tuberculosis to the Ministry.
Chas. J. Bond, F.R.C.S. Eng., Honorary Consulting Surgeon in East Midland Region.
Astley Vavasour Clarke, M.D. Camb., Honorary Consulting Physician in East Midland Region.
Sir Arthur Chance, F.R.C.S.I., Honorary Consulting Surgeon, Ireland, South Region.
William Richard Dawson, M.D. Dub., F.R.C.P. I., Honorary Consultant on Functional Nervous and Mental Cases for Ireland.
Francis Carmichael Purser, M D. Dub., F.R.C.P. I., Honorary Consultant on Organic Neurological Cases for Ireland.

THE Sir Alfred Jones Laboratories, Pembroke-place, Liverpool, under the direction of the Liverpool School of Tropical Medicine, will be officially opened by Lord Leverhulme on Saturday, July 24th, at 2.30 P.M.

Mansfield House University Settlement, Barking-road, Canning Town, London, E. 16, is again open to receive as residents men who are prepared to devote time to social studies and activities.

THE fifty-seventh annual general meeting of the British Pharmaceutical Conference will be held at Liverpool from Monday next, July 19th, until the following Friday. Mr. C. A. Hill, B.Sc., Managing Director of the British Drug Houses, will preside, and will deliver an address on Progress in Science and Pharmacy, while an interesting list of scientific communications is announced.

Surgeon-Major J. K. Goodwin, A.M.D. (retired), died at his residence, Newton Abbot, Devon, on June 14th, in his 90th year. The deceased officer, who qualified in 1855, served through the China campaign (1860) and the New Zealand campaign (1862). He retired from the Service in 1876.

DONATIONS AND BEQUESTS.—By will the late Sir John Thomas, of Brook House, Wooburn, Bucks, left, among other bequests, £1000 each to the London Temperance Hospital, the High Wycombe and Earl Beaconsfield Memorial Hospital, and the Marlow Cottage Hospital.

Dr. Noel Dean Bardswell has been awarded the Bronze Médaille de la Reconnaissance Française by the French Red Cross for his services in advising the French Government in regard to the treatment of tuberculosis in the French soldier, and more particularly in connexion with the establishment of the Sanatorium Training Colony at Sillery, in the South of Paris.

REGISTRAR OF NURSES.—The Minister of Health has sanctioned the appointment by the General Nursing Council (established under the Nurses Registration Act, 1919, to form and keep a Register of Nurses for the Sick) of Miss Marian Scott Riddell, R.R.C., to be the Registrar of the Council. Miss Riddell, who was trained at St. Bartholomew's Hospital, was before the war matron of the Chelsea Hospital for Women. During the war she served as matron of the 2nd London General Hospital, and subsequently of the 53rd General Hospital in France, until she was appointed principal matron and afterwards Acting Matron-in-Chief of the Territorial Force Nursing Service.

BIRMINGHAM GENERAL HOSPITAL.—The financial position is causing much anxiety. In order to pay off a large overdraft at the bank the board of management, after much consideration, have recommended to the governors that securities be sold to realise a sum of £50,000. In addition they have decided to recommend that a maintenance charge be required from patients after Jan. 1st, 1921. The charge for in-patients over 12 years of age would be one guinea per week, and under 12 half-a-guinea a week. A reduction may be allowed in cases of patients staying for a less period than a week, and part or all of the charge may be remitted in case of necessitous patients.

VENEREAL DISEASES AMONG SEAMEN.—The International Labour Conference at Genoa has given attention to some aspects of the health of seamen, and notably the question of the prevention and treatment of venereal diseases. The delegates (who represent the Governments, shipowners, and seamen of a score of countries) were invited by Mrs. A. C. Gotto and Dr. Otto May, representatives of the National Council for Combating Venereal Disease, to attend a meeting on the question of combating venereal diseases in the Mercantile Marine. At this meeting the hope was expressed that the Conference would not disperse without taking some definite action to help on the work of fighting these diseases, and the following resolution was framed and submitted to the Conference:—

"The International Seamen's Conference, recognising the importance of taking active international measures for the prevention and treatment of venereal diseases in the Mercantile Marine, desires to urge upon the Health Section of the League of Nations the need for immediate attention to this subject. They would recommend for special consideration: (1) The provision of adequate facilities for the prevention and treatment of venereal diseases at all the principal ports; (2) the inclusion of venereal diseases among the conditions for which free drugs and treatment are provided for members of the Mercantile Marine; (3) the dissemination of appropriate information on the subject to seafarers, especially to those at training establishments; and (4) the provision of adequate facilities for recreation at all large ports under the administration of joint organisations representative of owners and seafarers. They desire in addition to call special attention of the international labour organisations to the importance of No. 4 about facilities for recreation."

According to an unofficial report this resolution was adopted by the Conference.

VENEREAL DISEASE IN ABERDEENSHIRE.—At a meeting of the Sanatorium Benefit and Venereal Disease Committee of the Aberdeen County Council held on July 8th the medical officer of health reported that the cases of venereal disease treated had been greatly increasing. The out-patients in the first year of the scheme, 1917–18, for the city and the county, had been 197. The next year the total was 383, and last year 738. The in-patients were the same, the accommodation being in full use. Regarding the suggested provision of out-patient venereal treatment at Peterhead and Fraserburgh the medical practitioners were of opinion that treatment centres there would not be used. The patients would prefer to go to the Aberdeen centre, where they were not known.

AMALGAMATION OF DENTAL SERVICE AT BRIGHTON.—It has been decided that there should be an amalgamation of the Brighton, Hove, and Preston Dental Hospital and the Brighton and District Dental Service; this amalgamation was carried out on July 1st. The Dental Hospital was established in 1886 and the Public Dental Service in 1907. The amalgamation was arranged with the object of extending the privileges on a much larger scale both to the necessitous poor and to those who are able to pay a small fee. A great saving of administrative expenditure as well as of time will, it is claimed, be effected by the amalgamation, and also a great deal of the time of those who give their services gratuitously, and those who carry out the full range of dental surgery at a very small fee. It is interesting to note that X ray photography and the pathological side of dental surgery are to be encouraged. The progress of dental work under this new scheme will be watched with great interest.

POST-GRADUATE WORK IN LONDON.—A considerable amount of post-graduate work has been arranged in London during the summer months, and within the next few weeks additional announcements are likely to come to hand. At the National Hospital for Diseases of the Heart a course covering two weeks will be held from Monday, July 19th, to Saturday, July 31st. Work will commence each morning at 10 o'clock, the first session being devoted to practical instruction in graphic methods (including the polygraph and electrocardiograph); at 11.15 laboratory and clinical demonstrations will be given illustrating the physiology, pathology, and therapeutics of the heart and circulation; clinical work in the wards and out-patient department will occupy the afternoon, and a daily lecture will be delivered at 5 o'clock. The number of entries for this course is limited, and the roll is now almost complete. Immediate application for the remaining tickets should be made to the Secretary of the Fellowship of Medicine, who will give all information as to the fees for the course.

The North-East London Post-Graduate College (Prince of Wales's Hospital, Tottenham) has arranged, in conjunction with the Fellowship of Medicine, an intensive course during the same period, which covers the various departments of medicine and surgery. Demonstrations will be given each day at 10.30 A.M., 11.45 A.M., 2 P.M., and 3 P.M., whilst a lecture will be delivered at 4.30 P.M. Luncheon will be obtainable in the neighbourhood of the hospital, and tea will be provided at 4 P.M. Graduates who desire to attend this course are asked to send in their names without delay to the Secretary of the Fellowship of Medicine, who will forward the necessary information as to the fees for the course, together with a complete syllabus of the demonstrations and lectures. The afternoon lectures are open to all qualified practitioners without fee.

Courses of lectures are now being given at the London Hospital and the Cancer Hospital. In the clinical theatre of the London Hospital Medical College Dr. Theodore Thompson and Dr. George Riddoch are giving a course of Neurology on the Tuesdays and Wednesdays in July and August at 2 P.M., the final lecture being given on August 18th. At the Cancer Hospital a course of clinical lectures on the Diagnosis and Treatment of Cancer is being given on the Tuesdays and Fridays in July and August at 4.30 P.M. In gynæcology Mr. Victor Bonney has resumed his "Talks on Gynæcology" at Middlesex Hospital each Saturday morning at 10.30 during July and August. The Wednesday afternoon lectures at Queen Charlotte's Hospital come to an end on July 28th.

For September a course of Proctology is being arranged at St. Mark's Hospital, City-road, and the postponed course on Spa Treatment will take place at Bath in the third week of September. Early application should be made to the secretary for tickets. The *Bulletin* of the Fellowship of Medicine contains the detailed syllabus of these courses, together with an extensive list of daily hospital appointments open to members of the Fellowship of Medicine. Graduates who intend to devote any portion of their time to study in London are invited to communicate with the Secretary of the Fellowship of Medicine, 1, Wimpole-street, W. 1, stating the class of work in which they are most interested.

PRESENTATIONS TO MEDICAL MEN.—Dr. H. Pattison Armstrong, police doctor at Kingston-on-Thames, has been presented with a gold stop-watch by the directors of the Anglo-American Oil Company for an attempt to save the life of Francis Walker, one of their employees. Walker was employed at the Kingston depôt and became overpowered by petrol fumes when working in a large storage tank. The foreman of the works had already made an unsuccessful effort to rescue Walker when Dr. Armstrong entered the tank and succeeded in placing a rope round him. He was hauled to the top alive but died shortly afterwards. —At a public meeting recently held at Frome, Somerset, Dr. J. M. Rattray was presented with a cheque for 100 guineas, raised by public subscription, as a mark of respect, on the occasion of his leaving the town after 38 years' residence.

ROWETT RESEARCH INSTITUTE AT CRAIBSTON.—Mr. John Quiller Rowett, who has given the munificent donation of £10,000 to the Institute for Research on Animal Nutrition at Aberdeen, was entertained at lunch on July 9th by the joint committee representing Aberdeen University and the North of Scotland College of Agriculture, which is in charge of the institute. In the absence of the principal, Sir George Adam Smith, Professor J. A. MacWilliam presided, and, in proposing the health of Mr. Rowett, remarked that they were witnessing the beginning of a scheme of the utmost promise. While the work of the institute related primarily to the nutrition of animals, the whole physical growth and well-being of man was intimately connected with the question of nutrition. It was in experimental work and in throwing light on the intricate problems of the proper feeding of human beings, especially of children, that the institute was destined to play such a great and fruitful part. Mr. Rowett, in reply, congratulated the University on having secured the services of two such brilliant investigators as Dr. J. B. Orr and Dr. Plimmer as director and chief biochemist respectively.

Appointments.

ALDERSON, G. G., F.R.C.S., has been appointed an Honorary Surgeon of the Warneford General Hospital, Leamington, Spa.

BRYAN, C. W. G., *M.C.*, F.R.C.S., Surgeon in charge of out-patients (additional), and in charge of the Orthopædic Department, St. Mary's Hospital.

DAVIDSON, MAURICE, M.D. Oxon., M.R.C.P. Lond., Honorary Physician to the Miller General Hospital for South-East London.

ROTH, P. B., F.R.C.S. Eng., Orthopædic Surgeon, Miller General Hospital, Greenwich.

The Hospital for Sick Children, Great Ormond-street: PATERSON, DONALD H., B.A., M.B., Ch.B., Medical Registrar and Pathologist; BOND, CHARLES E., M.B., M.R.C.S., L.R.C.P., Casualty Medical Officer

Vacancies.

For further information refer to the advertisement columns

Ashton-under-Lyne Union.—Asst. Med. Supt. and Asst. M.O. £300.
Bath, Royal United Hospital. H.P. £150.
Bermondsey Medical Mission, 41, Grange-road, Bermondsey, S.E.—Female Sen. Res. M.O. £200.
Birkenhead Borough Hospital.—Jun. H.S. £200.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £150.
Bolton Infirmary and Dispensary.—Female Sen. H.S. £300.
Bradford City.—Female Asst. M.O. £450 plus £67 12s.
Bradford Royal Eye and Ear Hospital.—Aural S.
Bristol General Hospital.—Cas. H.S. £175.
Bristol Royal Infirmary.—Act. Hon. Asst. Obst. P. Also Res. Locum Tenens. 5 gs. a week.
Cardiff City Mental Hospital, Whitchurch, near Cardiff.—Sen. Asst. M.O. £550.
Cardiff, King Edward VII. Hospital.—H.S.'s. £200.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Didworthy, South Brent, Devon and Cornwall Sanatorium for Consumptives.—Asst. M.O. £250.
Edinburgh, Royal College of Physicians Research Laboratory.—Supt. £1000. Also Asst. to Supt. £500.
Glasgow, Victoria Infirmary.—Med. Tutor and Surg. Tutor. £250. Also two Jun. Asst. P's. and three Jun. Asst. S's. £100.
Gloucester County Asylum.—Jun. A.M.O. £300.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. £175.
Great Northern Central Hospital, Holloway, London, N.—H.P. £150.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Cas. S.O. £150.
Hereford County and City Mental Hospital.—Jun. Asst. M.O. £350.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50.
Huddersfield County Borough Education Authority.—Dent. S. £450.
Huddersfield Royal Infirmary.—Sen. H.S. £250.
Huddersfield, Storthes Hall Asylum, Kirkburton.—Sen. Asst. M.O. £500.
Hull Royal Infirmary.—Asst. H.S. £150.
Kettering and District General Hospital.—Res. M.O. £300.
Kilmarnock Infirmary.—H.S. £200.
King's Lynn, West Norfolk and King's Lynn Hospital.—Res. M.O. £150.
Leeds, City of.—Asst. M.O. for Maternity and Child Welfare. £500.
Leeds General Infirmary.—Two H.P's.
Leeds Infirmary, Beckett-street, Leeds.—Two Asst. M.O's. £400.
London (Royal Free Hospital) School of Medicine for Women: Anatomical Department.—Sen. Demonstrator. £150. Also full-time Demonstrator. £250. Two part-time Demonstrators.
Maidstone, Kent County Council.—Tuberc. O. £670.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Maidstone, West Kent General Hospital.—H.S. £250 Also H.P. £200.
Manchester, Ancoats Hospital.—Res. M.O. £150. Two Jun. H.S.'s. £100. Hon. Dent. S.
Manchester, Baguley Sanatorium for Tuberculosis.—Third Asst. Res. M.O. £300.
Manchester Royal Infirmary, Roby-street, Manchester.—Res. M.O. £200. Also H.P. £50 and £100.
Manchester Royal Infirmary.—Asst. Director, Clin. Lab. £300.
Margaret-street Hospital for Consumption, 26, Margaret-street, W.—Asst. Hon. P.
Miller General Hospital for South-East London, Greenwich, S.E.—Res. Cas. O. £150. Also H.S. £100.
Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. Res. M.O. £200.
Norwich, Administrative County of Norfolk.—Tuberc. O. £600.
Nottingham General Hospital.—Res. Cas. O. £300.
Plymouth Education Authority.—Dep. M.O.H. £600.
Plymouth, South Devon and East Cornwall Hospital.—H.P. £140.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—District Res. M.O. £80.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Anæsth. £95. Also Path. £300.
Roll of Honour Hospital for Children, 688, Harrow-road, W.—Female Hon. Asst. P. and Temp. Asst. P.
Rotherham Hospital.—Jun. H.S. £150.
Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £250.
St. Albans, Herts County Mental Hospital, Hill End.—Locum Tenens M.O. Eight guineas a week.
St. Helens Education Committee.—Dentist. £500.
Sheffield, Children's Hospital, Western Bank.—H.S. £200.
Sheffield Royal Hospital.—Asst. Cas. O. £150.
Sheffield Royal Infirmary.—H.P. £150.
Southampton, Royal Free Hospital.—Locum Tenens.
Stafford, Staffordshire General Infirmary.—H.S. £250.
Staffs Education Committee.—Practitioners under M.O.H. and Sch. M.O. £600.
Sunderland Royal Infirmary.—Jun. H.S. £200.
Swansea General and Eye Hospital.—Jun. H.S. £200.
Taunton and Somerset Hospital.—Sen. and Jun. H. S.'s. £200 and £150 respectively.
Townsville, Queensland, Australia.—Director, Institute of Tropical Medicine. £1200.
Warrington Infirmary and Dispensary.—Jun. H.S. £200.
West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—H.P. £300.
West London Hospital, Hammersmith, W.—H.S. and H.P. £50. Also Asst. S.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Asst. S.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Asst. Res. M.O. £350.
Wolverhampton and Staffordshire General Hospital.—H.S. £200.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.
Worcestershire County Council.—Asst. County M.O.'s and Sch. Oculist. £500 each.

The Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Bishop's Waltham (Hants) and at Bothwell (Lanark).

Births, Marriages, and Deaths.

BIRTHS.

CHANDLER.—On July 12th, the wife of F. G. Chandler, M.A., M.D. Cantab., M.R.C.P., of Harley-street, W., of a daughter.

CLARK-KENNEDY.—On July 5th, the wife of A. E. Clark-Kennedy, M.R.C.S., of Corpus Christi College and Bateman-street, Cambridge, of a daughter.

SCOTT.—On July 11th, at 5, Marion-crescent, Selkirk, the wife of Major T. H. Scott, D.S.O., M.C., R.A.M.C., of a son.

MARRIAGES.

BARLOW—MACDOUGALL.—On July 8th, at St. Mary-in-the-Castle, Hastings, Henry Percy Barlow, M.B., Parkstone, Dorset, to Adelaide Isabella, daughter of the late A. MacDougall, Edinburgh.

HUTCHINSON—KER.—On July 8th, at St. Stephen's, Ealing, Lieut. Charles A. Hutchinson, R.A.M.C., to Elsie Norah, third daughter of Mr. and Mrs. R. L. Ker, Amherst-avenue, Ealing.

LIVINGSTON—LEGASSICKE-CRESPIN.—On July 8th, at St. Mary Abbot's, Kensington, Flight-Lieut. Philip Clermont Livingston, R.A.F., M.S., B.A. Cantab., M.R.C.S., D.P.H., to Lorna Muriel, only daughter of Mr. and Mrs. Legassicke-Crespin, late of West Cromwell-road, Kensington, and Modbury, Devon.

MURPHY FETHERSTONHAUGH-FRAMPTON.—On July 8th, Major Leo Murphy, D.S.O., R.A.M.C., to Millicent, daughter of Mr. and Mrs. Fetherstonhaugh-Frampton, of Moreton, Dorset.

DEATHS.

BERNARD.—On July 10th, at Sydenham-road, Bristol, David Edward Bernard, M.R.C.S., L.R.C.P., aged 78.

DICK.—On July 12th, at Bembridge, Isle of Wight, Inspector-General of Hospitals and Fleets Sir James Nicholas Dick, K.C.B., R.N., Honorary Surgeon to the King, aged 89

REINHARD-RUTLAND.—On July 8th, at Weymouth-street, Charles Emmanuel Reinhard-Rutland, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE.
MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.
A Course of Twelve Lectures on Neurology, open to Students and Graduates of the London Hospital and other Schools—
TUESDAY, July 20th.—2 P.M., Lecture III.:—Mr. Riddoch: Disorders of Function from Lesions of the Cerebellum and its Connexions.
WEDNESDAY.—2 P.M., Lecture IV.:—Dr. Thompson: Varieties of Cerebellar Disease.
SURGICAL UNIT, in the Units' Lecture Theatre, London Hospital, E.
Special Course of Lectures open to both Students and Post-Graduates.
Two Lectures on Coli Infection of the Kidney—
WEDNESDAY, July 21st.—4 P.M., Lecture II.:—Mr. F. Kidd.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, July 19th.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
TUESDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2.30 P.M., Mr. T. Gray: Operations.
WEDNESDAY.—2 P.M., Mr. D. Armour: Visit to Surgical Wards. 2.30 P.M., Mr. Addison: Operations.
THURSDAY.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2.30 P.M., Mr. T. Gray: Operations.
Daily:—10 A.M., Ward Visits. 2 P.M., In-patient Clinics and Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, July 19th—10.30 A.M., Mr. J. H. Evans: Cystoscopy. 11.45 A.M., Dr. Whiting: Graphic Method of Studying Heart Disease. 2 P.M., Dr. Sundell: Diseases of Ductless Glands. 3 P.M., General Hospital Work. 4.30 P.M., Lecture:—Dr. R. Hutchison: Abdominal Pain and its Diagnostic Significance.
TUESDAY.—10.30 A.M., Mr. Benians: Blood Changes in Disease. 11.45 A.M., Mr. N. Fleming: Injuries of the Eye. 2 P.M., Dr. R. M. Leslie: Cases of Lung Disease. 3 P.M., General Hospital Work. 4.30 P.M., Lecture:—Dr. R. M. Leslie: The Rôle of Endocrinous Glands in Health and Disease.
WEDNESDAY.—10.30 A.M., Dr. Alexander: Investigation of Dyspeptic Conditions. 11.45 A.M., Mr. Carson: After-Treatment of Abdominal Operations (uncomplicated). 2 P.M., Mr. J. H. Evans: Diseases of the Breast. 3 P.M., General Hospital Work. 4.30 P.M., Lecture:—Dr. A. F. Hurst: Nature and Treatment of Hysteria.
THURSDAY.—10.30 A.M., Mr. Hayton: Laryngoscopy and Rhinoscopy. 11.45 A.M., Mr. N. Fleming: Refraction of the Eye. 2 P.M., Dr. Metcalfe: Treatment of Lupus by X Rays. 4.30 P.M., Clinical Consultations (Obscure Medical Cases).
FRIDAY.—10.30 A.M., Mr. Benians: Cellular Exudate in Gonorrhœa. 11.45 A.M., Dr. Whiting: Graphic Method of Studying Heart Disease. 2.30 P.M., Dr. Leslie: Auscultation of the Lungs, Common Fallacies. 3 P.M., General Hospital Work. 4.30 P.M., Lecture:—Mr. H. D. Gillies: Plastic Surgery of the Face and its Application to Civil Conditions.
SATURDAY.—11 A.M., Dr. Macarthur (at the L.C.C. Mental Hospital, New Southgate): Cases of General Paralysis

MALE LOCK HOSPITAL, Dean-street, W.
MONDAY, July 19th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

CANCER HOSPITAL, Fulham-road, S.W.
Clinical Lectures on the Diagnosis and Treatment of Cancer.
TUESDAY, July 20th.—4.30 P.M., Mr. W. E. Miles: Cancer of the Rectum.
FRIDAY.—4.30 P.M., Dr. R. Knox: X Rays in Cancer of the Alimentary Tract.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street (behind Whitworth Park).
THURSDAY, July 22nd.—4.30 P.M., Dr. A. C. Magian: Chronic Uterine Complaints.

BOOKS, ETC., RECEIVED.

ALCAN, F., Paris.
Etude critique de l'étiologie des bronchites chroniques avec sclérose pulmonaire. Par le Dr. Jacques Dalsace. Pp. 138. Fr.5.

APPLETON, D., AND Co., London and New York.
Ophthalmology. By L. Webster Fox, M.D., LL.D. 3rd ed. Pp. 831. 35*s*. net.
A Text Book of Histology. By H. E. Jordan, Ph.D. and J. S. Ferguson, M.Sc., M.D. 2nd ed. Pp. 857. 25*s*. net.

BAILLIÈRE, TINDALL, AND COX, London.
Practical Chemistry, including Simple Volumetric Analysis and Toxicology. By P. A. E. Richards, F.I.C. 3rd ed. Pp. 149. 5*s*.
Meat and Food Inspection. By W. Robertson, M.D. 2nd ed. Pp. 292. 18*s*.
X Ray Atlas of the Systemic Arteries of the Body. By H. C. Orrin, F.R.C.S. Edin. Pp. 92. 12*s*. 6*d*.

BLACK, A. AND C., London.
Fundamentals in Sexual Ethics: An Enquiry into Modern Tendencies. By S. Herbert, M.D. Lond. Pp. 350. 12*s*. 6*d*. net.

CASSELL AND Co., London.
Assessment of Physical Fitness by Correlation of Vital Capacity and Certain Measurements of the Body, with Tables. By Prof. G. Dreyer and Lieut. G. F. Hanson, American Medical Air Service. Pp. 116. 10*s*.

CHAPMAN AND HALL, London.
Cocoa and Chocolate. By A. W. Knapp, B.Sc. Pp. 210. 12*s*. 6*d*.

FROWDE, H., AND HODDER AND STOUGHTON, London.
Common Infections of the Kidneys with the Colon Bacillus and Allied Bacteria. By F. Kidd, M.B., F.R.C.S. With additional lecture on Bacteriology of the Urine. By Dr. P. Panton. Pp. 332. 18*s*.

HUMPHREYS, ARTHUR L., London.
A St. Helena Who's Who, or a Directory of the Island during the Captivity of Napoleon. By A. Chaplin, M.D. Pp. 257.

KIMPTON, H., London.
Arteriosclerosis and Hypertension, with Chapters on Blood Pressure. By L. M. Warfield, M.D. 3rd ed. Pp. 266. 24*s*.
Personal Beauty and Racial Betterment. By Prof. K. Dunlap. Pp. 96. 6*s*.

LIBRAIRIE LE FRANÇAIS, Paris.
Curiosa de Médecine. By Dr. G. J. Witkowski. Pp. 272. Fr.6.

LIBRAIRE OCTAVE DOIN, Paris.
L'Aerophagie, Syndromes Gastriques, Intestinaux, Circulatoires et Respiratoires. Etude Clinique, Radiologique et Thérapeutique (l'Adulte, l'Enfant, le Nourrisson). Par le Docteur G. Leven. Pp. 228. Fr.6.

LONGMANS, GREEN, AND Co., London and India.
An Indian Pioneer of Science: Life and Work of Sir Jagadis C. Bose, M.A., D.Sc., LL.D., F.R.S., C.I.E., C.S.I., Emeritus Professor, Presidency College, Calcutta, Director of the Bose Research Institute. By Prof. Patrick Geddes. With portraits and illustrations. Pp. 259. 16*s*.

MACMILLAN AND Co., London and New York.
Applied Eugenics. By Mr. Paul Popenoe and Prof. R. H. Johnson. Pp. 459. 14*s*.

MARCUS, A., and WEBER, E., Bonn.
Die Therapie an den Bonner Universtitätskliniken. By Prof. R. Finkelnburg. Pp. 745. M.36.

MURRAY, JOHN, London.
Nerves and the Man. By W. C. Loosmore, M.A. Pp. 234. 6*s*.

NISBET AND Co., London.
The Fellowship of the Picture: An Automatic Script taken down by Nancy Dearmer. Pp. 110. 3*s*. 6*d*.

UNIVERSITY OF LONDON PRESS, 18, Warwick-square, London, W.C.
Greek Science and Modern Science. By Dr. Charles Singer. Pp. 22. 1*s*. 6*d*.

UNIVERSITY PRESS, Cambridge.
Psychoneuroses of War and Peace. By M. Culpin, M.D. Pp. 128. 10*s*.

URBAN AND SCHWARZENBERG, Berlin and Vienna.
Taschenbuch der Frauenheilkunde. Von Dr. Koblauck. Pp. 282. M. 54.
Taschenbuch der Augenheilkunde. Von Prof. C. Adam. Pp. 400. M. 66.
Handbuch der klinischen Hydro-, Balneo-, und Klimatherapie. Von Prof. A. Strasser, Dr. F. Kisch, und Prof. E. Sommer. Pp. 911. M.210.

VOGEL, F. C. W., Leipzig.
Pathologische Physiologie des Chirurgen (Experimentelle Chirurgie). By Prof. F. Rost. Pp. 614. M.38.

Communications, Letters, &c., to the Editor have been received from—

B.—Dr. W. H. Baines, Buffalo; Dr. R. D. Batten, Lond.; Mr. A. W. Bourne, Lond.; Dr. L. S. Burrell, Lond.; Bristol University, Registrar of; Dr. N. D. Bardswell, Lond.; Dr. H. O. Butler, Lond.; Bird Sanctuary Committee, Hon. Sec. of; Dr. A. Blackhall-Morison, Lond.
C.—Dr. S. D. Clippingdale, Lond.; Chadwick Trust, Sec. of; Mr. W. M. Coleman, Cambridge; Dr. E. N. Cook, Lond.; Dr. P. J. Cammidge, Lond.; Dr. J. B. Christopherson, Lond.
D.—Dr. H. Drinkwater, Wrexham; Department of Agriculture, Ottawa; Dr. P. J. Delaney, Claremorris.
E.—Edinburgh Faculty of Medicine, Dean of; Dr. A. M. Elliot, Lond.; Dr. H. A. Ellis, Lond.
F.—Fellowship of Medicine, Sec. of; Mr. W. R. Fairbrother, Lond.; Food Education Society, Sec. of.
G.—Capt. R. L. Gamlen, I.M.S.
H.—Maj.-Gen. P. Hehir, I.M.S.; Dr. F. Heatherley, Manchester; Sir Thomas Horder, Lond.; Dr. C. Hirsch, Lond.
I.—Dr. E. G. B. Ibotson, Corris; International Labour Office, Lond.
J.—Dr. J. H. Jones, Standford Dingley.
K.—Mrs. A. E. Kamp.
L.—London Hospital, Director of Medical Unit; Liverpool University, Registrar of; Liverpool School of Tropical Medicine, Acting Sec. of; Dr. Lediard, Carlisle; *London University Gazette;* Dr. W. A. Loxton, Birmingham.
M.—Ministry of Health, Sec. of; Metropolitan Hospital Sunday Fund, Sec. of; Mental Hospitals Association, Sec. of; Dr. L. McGavin, Lond.; Ministry of Health, Public Information Branch; Dr. A. G. Middleton, Brooklands; Ministry of Pensions, Special Grants Committee; Dr. J. C. McWalter, Dublin.
P.—Prof. T.H. Pear, Manchester; Maj. F. J. W. Porter, R.A.M.C.
R.—Dr. G. Riddoch, Lond.; Royal Statistical Society, Chief Clerk of; Mr. A. R. Reade, Lond., Dr. W. T. Ritchie, Edinburgh; Dr. A. H. Roffo, Lond.
S.—School of Physic in Ireland, Registrar of; Capt. C. T. Strange, R.A.M.C.; Save the Children Fund; Dr. S. Samuel, Leeds; Société des Sciences de Montpellier; Sheffield University, Registrar of; Dr. G. A. Stephens, Swansea; Mr. W. M. Scott, Bridgwater.
T.—Dr. D. Thomson, Lond.; Dr. S. R. Tattersall, Lytham; Tan-Sad Works; Dr. F. H. Teale, Lond.
U.—Mr. S. Unwin, Lond.; U.S. Public Health Service.
W.—Dr. W. H. Wynn, Birmingham; Mr. W. Webster, Newcastle, Staffs; Mrs. M. Whitehead, Lymington.

Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Notes, Short Comments, and Answers to Correspondents.

A SURGEON AND AN EX-EMPEROR.

THE letters of William Warden, surgeon on Board H.M.S. *Northumberland*, the ship which conveyed Napoleon to St. Helena, were published in 1816 and went through more than one edition. Many medical men may be familiar with them, but they are generally cited as a contemporary record of certain phases in the earlier period of Napoleon's captivity, rather than for the glimpses which they give of British medical practice 100 years ago, as seen by a surgeon in the Royal Navy, and an "intelligent foreigner." The questions which Napoleon, as a strategist, a military organiser, and a politician, showered upon those officers with whom he was brought in contact during the *Northumberland's* voyage, were no doubt, as Mr. Warden affirms, directed to those who could best give the information asked for, and in the best manner for extracting it. Those which he asked of a medical man to whom he evidently had taken a fancy show him as rising indeed above the level of a Count Smorltork, but hardly as a man of acute intelligence mastering rapidly the essentials of the subject of his inquiry. In fact, he laid down the law and cross-questioned Warden about as comprehensively and with no greater acumen than the average exalted personage or layman successful in his own walk of life, whom chance brings into contact with a medical man unable to escape from him. "In the course of your practice and on your conscience, how many patients have you killed?" and, in discussing the merits of a drug which he had denounced as a "bad medicine," "Did Hippocrates use it?" are hardly the questions of a master mind, although the first was put "with a half-comic, half-serious countenance," and the latter was not difficult to answer. In reply, Mr. Warden was able to say politely, if platitudinously, that his conscience did not accuse him of having caused the death of anyone, and with regard to Hippocrates, that although he was, as Napoleon put it, among the first physicians, he "might have derived great advantages from modern discoveries"—courteous replies to an exalted personage. Napoleon, however, did not always ask absurd questions, and as he no doubt had often tried to pick the brains of eminent French doctors as pertinaciously as he did in the case of the ordinary Englishman with whom fate had brought him into contact, he presumably had learnt to voice their opinions. In the conversation into which he introduced Hippocrates he was questioning Warden's desire to treat General Gourgond's dysentery with mercury, and he put the case for non-intervention not unreasonably. "Does not nature endeavour to expel morbific matter, and may not the present painful struggle be an effort of nature to rid herself of what is obnoxious"? Warden was also not unreasonable in his reply: "I have been taught to assist nature."

Blood-letting: A British Panacea.

The ex-Emperor was constantly twitting Warden on the subject of the British fondness for blood-letting, although he stated on one occasion that when his Empress was confined he had himself suggested bleeding her, as "she was in a very full habit." Dr. Corvesart, who was attending her, and in whom he had evidently great confidence, had refused, and no doubt expressed views held by other Frenchmen as to the British panacea. Warden staunchly, and perhaps patriotically, upheld the efficacy of bleeding, citing as conclusive a case from his own experience, which might almost be described as awe-inspiring. At any rate, he does not record any retort from his hearer, and concludes by saying that it was "enough to make anyone a convert to the lancet." He had, he said, on one occasion in three days reduced the pulse of a seaman sick with "an inflammation of the stomach" from 150 beats in the minute to 87, taking from him in the time mentioned 15 lb. of blood. The story, at any rate, must have impressed on his hearers the stalwart physique of the victors of the Nile and Trafalgar.

Comparisons between French and English Surgeons.

If Warden's replies when dealing with the causes and treatment of disease serve to illustrate the progress of a century in science, some of those upon more general topics connected with medicine might have been given *mutatis mutandis* to-day to any "intelligent foreigner." By this it is not intended to suggest that the distinctions drawn by Warden between British and French surgery would be couched in the same terms as in 1816, but merely that the principles of comparison would be the same. At any rate, the honourable aims and standards of British medicine have remained the same for 100 years, and Warden showed himself a sensible, level-headed man, properly jealous of the honour of his profession.

"Which do you think are the best surgeons, the French or the English?" Napoleon inquired. "The English, undoubtedly."

"But wherefore?"—"Because our schools are better. There is more system in our education, and the examination is such as to establish the fitness of any candidate for the profession before he is regularly admitted into it."

"But in point of practice will you not allow that the French surgeons have the advantage of you?"—"In practice, General, the French are empirics. Though they do not vend nostrums like our quacks in England. They are, in fact, more guided by experience than theory. But you, Sir, have enabled my brethren in the English army to be tolerable proficients in field practice."

Napoleon smiled, and changed the subject, still intent upon comparisons.

"Who is your first physician in London?"—"That is an inquiry which I did not expect and cannot take upon myself to answer; there are so many physicians of eminence there that it would be hazardous to mention a favourite name."

"But have you no particular person in the profession who takes the lead?"—"No, indeed; there are, it is true, fashionable physicians who have their run for a season or two, or even three, but I could not give the preference to one without doing injustice to fifty. I could, I think, more particularly distinguish eminent surgeons."

"What is the general fee?"—"That frequently depends upon the rank and fortune of the patient."

"What is the highest you have ever known?"

Warden was cautious in his answers as to medical fees and medical fortunes, and the ex-Emperor seems to have asked the question in order to introduce the statement that Corvesart had received 3000 napoleons for attending the Empress Maria Louisa in her confinement.

Warden's Remuneration.

The subject then was changed abruptly to Warden's own practice and position. Was he employed on shore, as well as at sea? And did he receive good fees when he visited the patient of a friend? As to this last he answered, "I have never yet accepted of a fee. While I serve I am satisfied with my pay." He was a worthy man indeed, with a contented soul, for his pay at that time, as he told his questioner, was but £220 per annum after 20 years' service in the navy. Moreover, at St. Helena living was not cheap. "A stranger cannot board under 30*s*. a day." So he made both ends meet by accepting the hospitality of his friends and having some of his meals on board the *Northumberland*. He admitted that his navy pay was small, but declared that he had no right to complain, as he knew the conditions of service before he engaged, and in England there was no compulsion to serve. So he went on placidly to explain where he was educated, citing to Napoleon the names of Black, Munro, and Gregory as eminent names in medical education at Edinburgh, with the reservation that he could name equally eminent teachers in England. Napoleon had strong views of his own, needless to say, on the comparative merit of his own medical advisers. "I never knew," he said, "but one physician who was infallible in his diagnostics. He was certain in his discovery of the nature and seat of a disease; his name was Dubos; but strange to say, he could not prescribe; and consequently would never undertake the treatment or cure of a complaint whose character his acumen could so accurately penetrate." It was soon after this interview that Warden left St. Helena, with a prospect of some day retiring on a pension of 6*s*. a day, to be increased only if he should then have served for 30 years.

SPECIAL PENSIONS GRANTS.

THE regulations of the Special Grants Committee of the Ministry of Pensions have been extended and revised, and the Committee is now in a position to consider applications from—

1. Officers disabled in the war (*a*) in respect of their wives, up to a maximum of £50 a year; (*b*) in respect of their children up to a maximum of £36 per annum for each child.
2. The widows and dependents of deceased officers.
3. Nurses belonging to the Imperial Military or other nursing services, who served in the war.

These regulations will shortly be on sale at H.M. Stationery Office, price 1*d*. Claims should be addressed to the Secretary, Special Grants Committee (Officers Section), Millbank House, London, S.W.1.

ROYAL UNITED HOSPITAL, BATH.

A REPRESENTATIVE meeting was recently convened by the Mayor of Bath to consider the serious financial position of the Royal United Hospital. After some discussion it was eventually decided to build an institution at Combe Park, on the site of the present Pensions Hospital. It is proposed first to establish wards for persons of limited means, who will pay moderate fees, and ultimately it is hoped to remove the whole hospital from its present position in the centre of the city to Combe Park. The entire scheme will involve an expenditure of about £148,000. Mr. F. Mallett has promised to purchase the site, which will cost £5000. Promises of amounts totalling £20,000 have already been received towards the scheme.

SANITARY ADMINISTRATION IN THE PUNJAB, 1918.

THE population of the Punjab at the 1911 census was 19,337,146, and for the year 1918 was estimated at 20,205,141. Calculated on this total, the birth-rate was 37·9, and the death-rate 77·5 per 1000; if estimated on the census figures these ratios would be 39·6 and 81 per 1000 respectively. The birth-rate (39·6) was considerably below that for the preceding quinquennium (45·2), but higher than that in the neighbouring North-West Frontier Province (30·58), and in Madras (28·89), as well as in many other provinces, during 1918. There was very great variation in the ratios for different districts. Thus in Karnal there were 51·3, and in Rohtak 49·2 births per 1000, while in Simla the ratio was only 21·2, and in Dera Ghazi Khan 19·3. The death-rate was for the whole province 81 per 1000, the total number of deaths being 1,565,560. This mortality ratio is the highest recorded in the Punjab since 1867, the excess being due entirely to influenza, recorded under the head of fevers. Lieutenant-Colonel W. H. C. Forster, I.M.S., Sanitary Commissioner for the province, who presents this report, gives a detailed and graphic account of the visitation, which, he states, was the worst epidemic that the Punjab has ever experienced, and—

"one which, with almost diabolical malignancy, selected young adults for its victims. A peculiarly fatal type of pneumonia appeared as a concomitant of the disease, and from Oct. 15th to Nov. 8th the state of the province was such as to render adequate description impossible. The hospitals were choked so that it was impossible to remove the dead quickly enough to make room for the dying; the streets and lanes of the cities were littered with dead and dying people; the postal and telegraph services were completely disorganised; the train service continued, but at all the principal stations dead and dying people were being removed from the trains; the burning ghâts and burial grounds were literally swamped with corpses, while an even greater number awaited removal; the depleted medical service, itself sorely stricken by the epidemic, was incapable of dealing with more than a minute fraction of the sickness requiring attention; nearly every household was lamenting a death, and terror and confusion reigned everywhere. ..... The great malaria epidemic of 1908 and the worst years of plague fade into insignificance beside this epidemic, which in three months, October-December, killed 962,937 people."

This mortality is equivalent to 49·8 per 1000 of the population according to the 1911 Census, or 45·8 per 1000 on the population as estimated for the year 1918. The European population escaped lightly. Among commissioned officers and their families, and for Europeans generally, the mortality was trifling, well under 5 per cent. of the cases; at the military asylums of Sanawar and Ghora Galli there were 398 cases and no deaths. For the Indian population of the better class, and among those provided with medical aid, it is estimated at about 6 per cent.; among the poorer classes "anything from 50 per cent. upwards." Among the jail population in the province there were 4475 cases and 520 deaths from influenza, giving a case-mortality of 11·6 per cent. Rural areas suffered more than the towns, this being due, in Colonel Forster's opinion, to the two circumstances that "for practical purposes the rural areas, even in normal times, are without qualified medical aid," and "the rural population is unable to benefit from communal effort—itself energised by competent directing authority—to anything like the same extent as the urban population." The preventive measures considered to be most important are: improvement of housing conditions, as soon as this becomes practicable; the provision of medical aid, at the rate of one qualified practitioner per 100 square miles on an average; antiseptic treatment of the naso-pharynx; attention to personal hygiene; and avoidance of all crowded places. Preventive inoculation is not recommended.

Cholera caused 257 deaths, only 0·01 per 1000 of the population, less than in any year since 1902. Under "fevers," from which 1,287,027 deaths were registered, giving a death-rate of 66·56 per 1000 (as compared with the quinquennial mean of 19·12), the large increase was due to influenza. At Simla there were 22 cases of enteric fever, 15 being among Europeans in various parts of the station, and apparently unconnected with each other. There were 3032 deaths from small-pox, compared with 1417 in the previous year (0·16 and 0·07 per 1000 respectively). Vaccination was interfered with by the influenza epidemic. Colonel Forster has made a good start in the education of the general public in matters of elementary hygiene. He has had diagrams and lantern slides prepared from photographs taken by himself, and intends developing this work, which is likely to have excellent results.

REFRACTOMETERS.

APPLICATIONS of the refractometer to physiological and clinical analysis have received of late years a great deal of attention in Germany and America. Since refractometers are now among the none too numerous scientific instruments which in this country are made better than in any other it is to be hoped that their applications to such problems will be encouraged. The Abbe and Dipping refractometers are well known to organic chemists, and are generally regarded as indispensable instruments in chemical research or control laboratories. Numerous papers have been written on the refractometer in physiological and clinical analyses. Robertson's method of estimating the proteins in 0·5 c.cm. of blood serum may be specially mentioned. Abderhalden gives a bibliography of the use of this instrument in the examination of blood, urine, cerebro-spinal fluid, &c., and for the control of the action of ferments and bacteria. Full particulars and reference to many such applications can be obtained from Messrs. Adam Hilger, Ltd., of 75A, Camden-road, London, N.W.1, who are makers of these instruments.

THE SPELMAN APPEAL.

IN our issue of May 15th last we published a moving appeal by Dr. P. J. Delaney in behalf of the widow and children of the late Dr. A. P. Spelman, of Dunmore, co. Galway, who was killed in a motor-car accident at the age of 26, leaving his family unprovided for. The list of subscribers to the Fund up to date is as follows:—

£10 10s.—Dr. McArdle, Merrion-square, Dublin; Dr. Burgess, Victoria Park, Manchester; Dr. Meade, Fitzwilliam-place, Dublin.

£5 5s.—Dr. Meenan, Stephen's Green, Dublin; Sir Wm. de Courcy Wheeler, Fitzwilliam-square, Dublin; Dr. Vincent Tighe, Upper Leeson-street, Dublin; Dr. E. B. Kinsey, Trinity Terrace, Derby; Dr. McLaverty, Merrion-square, Dublin; Dr. Mooney, Fitzwilliam-place, Dublin; Dr. P. J. Delaney, Claremorris, co. Mayo; Dr. T. A. Heneghan, Ballindine, co. Mayo.

£5.—Dr. McMichael, Tullamore, King's County; Dr. Kane, Rossington Lower, Doncaster; Dr. Melville, Church-square, Basingstoke; Dr. Phelan, Callan, co. Kilkenny; Capt. Richardson, R.A.M.C., 29th King's Liverpool Regiment, Calais; Dr. Cassiday, Lisnaskea, co. Fermanagh; Dr. Law, Coleraine, Derry.

£3 3s.—Dr. Mahon, Nile Lodge, Galway; Dr. McGuinness, Harcourt-street, Dublin; Dr. Morris, Devon-place, Galway; Dr. Flannery, Hollymount, co. Mayo; Dr. Rendall, Forest-grove, Nottingham; Dr. P. J. Kenelly, Tralee.

£3.—Dr. T. MacDonagh, Galway; Dr. Kennedy, Merrion-square, Dublin.

£2 10s.—Dr. McKinney, Lower Fitzwilliam-street, Dublin.

£2 2s.—Dr. O'Hea, Leeson-street, Dublin; Dr. Walsh, Westport, co. Mayo; Dr. O'Carroll, Merrion-square, Dublin; Dr. Gray, Kiltormer, Ballinasloe; Dr. Ronayne, Trafford Park, Manchester; Dr. Mangan, Carna, co. Galway; Dr. Dargin, Stephen's Green, Dublin; Dr. McNulty, Killala, co. Mayo; Dr. Martin, Clifton Vale, Clifton, Bristol; Dr. Elliott, Hookstown, co. Tyrone; Dr. Peck, Laton-road, Hastings; Dr. Solomons, Fitzwilliam-square, Dublin; Dr. MacLeod, Port-street, Evesham; Dr. Purcell, Blessington, Dublin; Dr. Brennan, Idione Terrace, Blackrock, Dublin; Dr. Lagan, Omagh, co. Tyrone; Dr. Redmond Keating, Tralee, co. Kerry; Dr. Keogh, Lower Fitzwilliam-street, Dublin; Dr. Kelly, Roscommon; Dr. Gilmour, Stephen's Green, Dublin; Dr. Ryan, M.P., Wexford; Right Hon. M. F. Cox, Merrion-square, Dublin; Dr. Doolin, Fitzwilliam-square, Dublin; Dr. Lockhart Stephens, Emsworth, Hants; Dr. Fitzgerald, Hollymount, co. Mayo; Dr. McDonnell, Vicker's Croft, Galway; Dr. Flannery, Tubbercurry, co. Sligo; Dr. Doyle, Gurteen, Sligo; Dr. Ryan, Clondalkin, Dublin; Dr. Florence Stoney, Poole-road, Bournemouth.

£2.—Dr. Clarke, Loughlin, co. Roscommon; Dr. McInery, Ballymacarbury, Waterford; Dr. G. McGuire, Claremorris, co. Mayo; Dr. Pollard, Cumberland-road, Bristol; Captain C. S. Hamilton, R.A.M.C., Exeter; Dr. Forde, Castlerea, co. Roscommon; Dr. Wilson, Ashton Lodge, Tunbridge Wells; Dr. Bride Martyn, Holgate Hosp., Lintorp, Middlesbrough; Dr. Cooney, Lusk, co. Dublin; Dr. Macnamara, Corofin, co. Clare; Colonel Macnamara, Corofin, co. Clare.

£1 1s.—Dr. Knott, Castlebar, co. Mayo; Dr. Stokes, Fethard, co. Tipperary; Dr. Wilson, Mercer's Hosp., Dublin; Dr. M. Ryan, Drury-lane, London; Dr. Barnaville, Lower Fitzwilliam-street, Dublin; Dr. Keane, Ennistymon, co. Clare; Dr. Broderick, Cabinteely, Dublin; Dr. Hawkshaw, Ballinrobe, co. Mayo; Dr. Cox, Med. Sec., B.M.A., Strand, London; Dr. Pope, The Garth, Hereford; Dr. E. Minceliens, Brook Hosp., Shooter's Hill, London; Dr. Burke, Princes-square, London; Dr. Hawkins, Constantine House, Avonmouth; Dr. Whiteside, Fazeley, Tamworth; Dr. McNeill, Pitlochry, England; Dr. Beirne, Charlestown, co. Mayo; Dr. Corboy, Fort Prospect, Limerick; Dr. Thompson, Tuam, co. Galway; Dr. Barry, Philipstown, King's County; Dr. Staunton, Swinford, co. Mayo; Dr. Mills, Ballinasloe, co. Galway Dr. Casey, Clifden, co. Galway; Dr. Sandays, Gort, co. Galway; Dr. Brown, St. Catherine's-place, Edinburgh; Dr. Ffennell, Southbourne, Bournemouth; Dr. Ryan, Glenlara, co. Tipperary; Dr. Campbell, County Hosp., Galway; Dr. Murphy, St. Patrick's Hill, Cork; Dr. Ryan, Pembridge Villas, London; Dr. Shepherd, Tulse Hill, London; Dr. O'Gorman, Gowran, co. Kilkenny; Dr. Duncan Scott, Simington, Cambridge; Dr. Dudley, High-street, Stourbridge, Worcester; Dr. Johnstone, Royal Asylum, Morningside, Edinburgh; Dr. Berry, Burnham, Somerset; Dr. Blight, Newport-road, Cardiff; Dr. McMillan, Roseberry-terrace, Glasgow; Dr. King, Dalkey, co. Dublin; Mr. Frank Healy, National Bank, Claremorris; Mr. Edward Fitzgerald, Ballinrobe; Dr. Charlotte Warner, Newcastle, co. Down; Dr. Branford Morgan, Tombland, Norwich; Dr. Rossiter, Ballinasloe, co. Galway; Dr. Waters, Carbury, co. Kildare; Dr. O'Brien, Merrion-square, Dublin.

£1.—Dr. Evelyn Fisher, Glyncorrwg, Port Talbot; Dr. M. McDonagh, Galway; Dr. Orton, Coventry, England; Dr. MacHenry, The Crescent, Galway; Anon.; Dr. Crean, Ballyhaunis, co. Mayo; Dr. McBride, Castlebar, co. Mayo; Dr. Madden, Kiltimagh, co. Mayo; Dr. Scanlon, Chelsea, London; Dr. Dickson, Lochgelly, Fife; Dr. M. Lee, Newport, co. Mayo; Dr. Crowley, Loughrea, co. Galway; A Friend (per P. J. Kenealy, Tralee); Dr. O. Sullivan, Crookstown, co. Cork; Dr. Mark Love, Lansdown, Stroud, England.

10s.—Dr. Hollis, Hove, Brighton; Dr. O'Malley, Gort, co. Galway; Sir James Verrall, Entry Hill, Bath.

7s. 6d.—Anon.

The list is signed by Dr. P. J. Delaney, Claremorris, and Dr. T. A. Henegan, Ballandine, both in co. Mayo, to whom further subscriptions may be sent.

The Croonian Lectures

ON THE

PSYCHOLOGY OF THE SPECIAL SENSES AND THEIR FUNCTIONAL DISORDERS.

Delivered before the Royal College of Physicians of London, June, 1920,

BY ARTHUR F. HURST, M.A., M.D. OXON., F.R.C.P.,
PHYSICIAN AND NEUROLOGIST TO GUY'S HOSPITAL.

LECTURE I.—CUTANEOUS SENSIBILITY AND CUTANEOUS ANÆSTHESIA.

MR. PRESIDENT AND GENTLEMEN,—When I received the honour of being invited to deliver the Croonian lectures it seemed to me right that I should attempt to apply some of the lessons I had learnt during the war to the problems of civil life. I was fortunate in having almost unique opportunities for investigating the neuroses, which occurred so frequently under the exceptionally trying conditions the British Army had to face on every front. In the course of my investigations on their origin and nature I made a number of observations which throw, I believe, some light on the psychology of the special senses and the physiology of the reflexes associated with them. As the most common neurosis affecting the special senses was hysteria, and as my views on the nature of hysteria differ from those held by the majority of neurologists, it will be necessary to explain what I mean by hysteria before I approach the main subject of these lectures.

NATURE AND DEFINITION OF HYSTERIA.

The word hysteria was first used by the Greek physicians to describe what is now known as an hysterical attack, under the impression that it was due to an actual displacement of the uterus into various parts of the body. In course of time numerous other conditions were recognised as being of a similar nature, and the word hysterical was used to describe them all. The etymology of the word coloured all the theories of the nature of hysteria up to the time of Charcot, almost every writer believing that it was associated with pelvic disorders and that it occurred only in women. Charcot, however, showed that it was not uncommon in men, and the earlier idea of its relation in women to pelvic disorders has been gradually discarded. The conception of the disease which I shall use in these lectures has nothing in common with the original one, and it might therefore be considered wise to use some other term than hysteria to describe it; but since this word has been accepted for so long a period by physicians in every country, it would be impossible to introduce any new term which would obtain universal approval. The word hysteria is indeed no more unsuitable than such words as rheumatism and chorea, which have also lost their original significance.

One common factor in all the symptoms, which are by universal consent regarded as hysterical, is their origin as a result of suggestion. When the history of each case is carefully investigated it is almost invariably possible to discover that some event or condition suggested its onset and led to the exact form of the symptoms present. If the view be accepted that hysterical symptoms are caused by suggestion, they must be capable of removal by psychotherapy without assistance from any more material method of treatment. We can thus state that an hysterical symptom is one which has been produced by suggestion and is curable by psychotherapy.

Physical Stigmata.

Gendrin, in an address to the Académie de Médecine in 1846, stated his belief that "hysteria is not only characterised by spasmodic attacks occurring at intervals, but it is a continuous disease, which in the intervals always presents characteristic symptoms," the most important of which "is a state of general or partial insensibility." Gendrin's views were to a great extent forgotten until they were revived by Charcot in 1871. Charcot taught that hysteria manifests itself in two ways—by persistent symptoms or stigmata, of which the patient is unaware, and temporary symptoms, which are obvious to the patient and lead him to seek medical advice. The former were supposed to be present before the latter appeared and to persist after they had disappeared. Amongst these stigmata the most constant, according to Charcot, were retraction of the field of vision, certain forms of cutaneous anæsthesia, and pharyngeal anæsthesia. His teaching soon became universally adopted, and few books on neurology or general medicine published in the last 50 years fail to mention these stigmata.

One of Charcot's most distinguished assistants, Babinski, was the first to throw doubt upon the importance of the stigmata he described. Babinski believes that they are not permanent symptoms at all, but, like the more obvious and temporary symptoms, are produced by suggestion. Instead of being produced by suggestion on the patient's part, they are the result of suggestion on the part of the physician. The evidence brought forward by Babinski in connexion with anæsthesia and retraction of the field of vision appears to me to be conclusive, and receives further confirmation from the investigations which I shall presently describe. We have obtained similar evidence with regard to pharyngeal anæsthesia, so that the question of physical stigmata may be regarded as settled.

It is so common to regard certain mental qualities as hysterical and to apply the term hysterical to a certain type of individual that it requires considerable courage to reject altogether the doctrine of a specific psychical disorder to which the name hysteria can be given. But on examining the literature it is at once apparent that no sort of unanimity exists as to what are the specific mental attributes of hysteria. For several years I accepted the definition of hysteria as an abnormal mental condition in which the individual is unduly prone to develop symptoms as a result of suggestion. But the experience of the war has taught us that, given a sufficiently powerful suggestion, there are probably no individuals who would not develop hysterical symptoms.

Abnormal suggestibility, like other mental attributes commonly regarded as characteristic of hysteria, is undoubtedly a most important predisposing cause of hysterical symptoms, but it is not an essential factor, and cannot therefore be regarded as an essential part of hysteria. As it may exist in an individual who never shows any hysterical symptoms owing to the absence of adequate exciting causes, abnormal suggestibility cannot be regarded as a disease, such as hysteria would designate, any more than irritability or any other mental attribute is a disease. Unless everybody can be regarded as a victim of hysteria, as everybody is liable under sufficient provocation to develop hysterical symptoms, suggestibility is not the mental basis of hysteria. Whether a given person will develop hysterical symptoms under given conditions depends on the degree of his suggestibility and the strength of the suggestion. It is clear therefore that abnormal suggestibility is simply a predisposing factor, and is no more a part of hysteria than a tuberculous family history is a part of tuberculosis. Many cases of gross hysterical symptoms occurred in soldiers who had no family or personal history of neuroses, and who were perfectly fit until the moment that one of the exceptionally powerful exciting causes, such as occur comparatively rarely apart from the war, suggested some hysterical symptom. After its disappearance as a result of psychotherapy the man was once more perfectly fit, and his subsequent history showed that he remained no more liable than any of his companions to develop new symptoms.

As soon as it is recognised that the mental stigmata which predispose to the development of hysteria are not themselves a part of hysteria, it becomes obvious that many cases of hysteria will be missed if it is only looked for in so-called hysterical persons. When, on the other hand, it is remembered that there is nobody who may not develop hysteria if the provocation is sufficiently great, it must follow that hysteria is infinitely more widespread than has generally been supposed.

We thus arrive at the conclusion that, apart from actual hysterical symptoms, there are no underlying physical or mental symptoms or group of symptoms, which precede and accompany them and persist after their disappearance, to which the term hysteria can be applied. It is clear therefore that while it is easy to define hysterical paralysis and hysterical anæsthesia, as they have certain attributes which distinguish them from all other forms of paralysis and anæsthesia, "hysteria" cannot exist in their absence. The only possible definition of hysteria is "the condition in which hysterical symptoms are present," hysterical symptoms being in turn defined as "symptoms which result from suggestion, and are curable by psychotherapy"; hysteria is thus a condition in which symptoms are present which have resulted from suggestion and are curable by psychotherapy.

I.—CUTANEOUS SENSIBILITY AND CUTANEOUS ANÆSTHESIA.

(1) *Hysterical Anæsthesia Following Hetero-Suggestion.*

I have already described how Charcot believed that cutaneous anæsthesia was a stigma of hysteria, which was present before any more obvious hysterical symptoms developed and persisted after their disappearance. It had three characteristic features: Firstly, it was rarely, if ever, recognised spontaneously by the patient, and was only discovered in the course of the physician's examination. "Hemi-anæsthesia," wrote Charcot, "is a symptom which requires to be sought for. There are many patients who are quite surprised when its existence is revealed to them." Secondly, it never caused any inconvenience to the patient, who was able to perform movements with normal accuracy so long as no paralysis was associated with it, and it never led to accidental burns or other injuries. Lastly, it always occurred in certain characteristic areas, such as one-half of the body, the whole of a limb, or the area covered by a glove or stocking. (Figs. 1, 2, and 3.)

Doubt was first thrown on the truth of Charcot's view by Herbert Page, who in his book on "Railway Injuries," published in 1891, asked the question, "May not sometimes the very examination of a hemi-anæsthetic patient largely determine the hemi-anæsthesia?" And he then observed that "the examination of a patient may sometimes produce the suggestion whereby anæsthesia results."

Nine years later Babinski failed to find any disturbance in tactile, painful, thermal, muscular, and stereognosis sense in any of a hundred consecutive cases of hysterical disorders, in which he was careful to avoid the possibility of suggestion. He concluded that the anæsthesia Charcot had described as so characteristic of hysteria was not recognised spontaneously by the patient and did not cause him any inconvenience, simply because it was not present until it had been unconsciously suggested by the observer in the course of his examination.

Babinski went so far as to state that there is no such thing as hysterical anæsthesia apart from that produced by the suggestion of the observer. In a paper on the subject published in 1908, I accepted Babinski's teaching without reservation, but from time to time since then I have seen cases in which hysterical anæsthesia appeared to have developed without any possibility of hetero-suggestion by a second person. These isolated cases remained unexplained until recently, when I gradually came to recognise that certain entirely different classes of hysterical anæsthesia exist, which differ from the only form described by Charcot and the authors of most text-books of medicine and neurology by showing none of the three characteristic features mentioned above. The patient is well aware of the existence of anæsthesia before he is examined; it causes more or less inconvenience and may lead to accidental burns and other injuries, and the areas of anæsthesia differ materially from those hitherto regarded as the only ones occurring in hysteria. The hysterical nature of these varieties of anæsthesia, which I shall presently describe in greater detail, may be extremely difficult to recognise, as the anæsthesia is always a sequel of the anæsthesia caused by some organic condition, and resembles the latter in all its details.

In 1917 I carried out some investigations with Mr. R. Gainsborough on the classical forms of hysterical anæsthesia described by Charcot. Twenty-nine healthy and intelligent individuals, of whom 25 were medical students, who had, however, not yet worked in the wards or read any clinical medicine, were asked to pretend that they had been in a railway accident, and that they were attempting to swindle the company by claiming compensation because of paralysis of the right arm and leg, which they alleged had resulted. They were to act as well as they could the part of men trying to persuade the medical examiner that they were really suffering from paralysis.

We first asked them whether there was anything else of which they complained besides paralysis of the arm and leg. The large majority said they were quite sure there was nothing else, even after being pressed for details. These results correspond with what occurs in patients suffering from hysterical paralysis. If they have not previously been examined they hardly ever volunteer that they have any anæsthesia. The following leading question was then asked: "Can you feel as well on your right side as on your left?" Twenty-two out of 27, including 2 who had spontaneously complained of numbness and 1 of coldness, said they felt less on the right side than the left. Another said he felt tingling on the right side. The remaining 4 said they had noticed nothing. This agrees with an observation made by Yealland, which I have since confirmed on numerous occasions. On asking a great number of non-medical individuals the following question: "Supposing you had loss of power in your wrist, fingers, and thumb, would you, or would you not, lose feeling?" the answer he obtained was always in the affirmative. When asked what would be the limits of the loss of feeling, a line was drawn round the wrist and less frequently round the forearm,

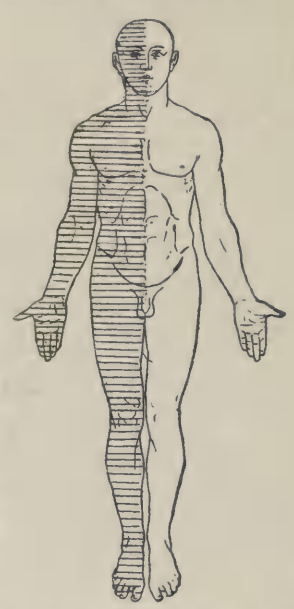


FIG. 1.—Hemianæsthesia in a man with hysterical fits. (After Charcot.)

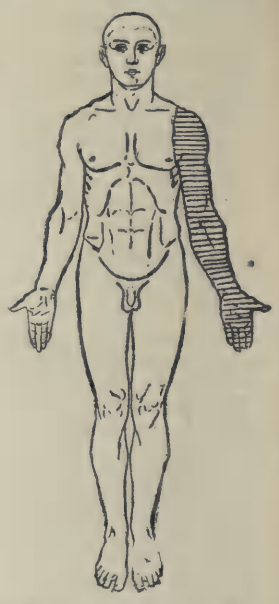


FIG. 2.—Sleeve anæsthesia in hysterical traumatic brachial monoplegia. (After Charcot.)

elbow, or shoulder. The replies to our leading question in the 27 "malingerers" correspond with the first stage in the production of hysterical anæsthesia, the idea of which first enters the patient's head when he is asked questions on the subject.

Cutaneous sensibility was then roughly tested. Six of the "malingerers" had right hemi-anæsthesia (Fig. 4), 5 had complete right hemi-anæsthesia except the face, 12 had anæsthesia of the whole arm and the whole leg (Fig. 5), 1 had hyperæsthesia of the whole arm and

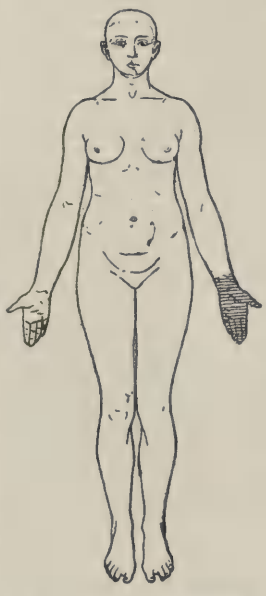


FIG. 3.—Glove anæsthesia in hysterical traumatic paralysis of hand. (After Charcot.)

FIG. 4.—Hemianæsthesia in "malingering" hemiplegia.

whole leg, and 4 had no anæsthesia. Seven were asked what the area of anæsthesia would be if only the hand and foot were paralysed: all replied that they would have anæsthesia of the distal part of the limb only, and

marked out typical glove and stocking areas at various points up the wrist and forearm and ankle and leg respectively (Fig. 6). I asked several other individuals what area, if any, of anæsthesia they would expect to accompany paralysis of the hand, forearm, and whole arm respectively. In most cases the area corresponded with the extent of the paralysis, glove anæsthesia occurring with paralysis of the hand, anæsthesia up to a line drawn round the elbow in paralysis of the forearm, and anæsthesia of the whole arm up to a line drawn through the axilla and over the shoulder with paralysis of the whole arm.

The results of these investigations correspond with the second stage in the production of hysterical anæsthesia. An investigation of cutaneous sensibility in suggestible individuals is very likely to produce anæsthesia, especially if the way has been prepared by questions on the subject, though this is not an essential preliminary. The area of anæsthesia corresponds with the individual's own ideas, just as in these cases of experimental malingering. Figs. 1 to 6 show areas which are generally regarded as typical areas of hysterical anæsthesia; they are really nothing more than the areas which anybody without knowledge of physiology would expect to become anæsthetic when

FIG. 5.—Anæsthesia of whole arm and whole leg in "malingering" hemiplegia.

FIG. 6.—Glove and sock anæsthesia in "malingering" hemiplegia.

the limbs are paralysed, the same individual variations being seen in these cases of "malingering" as in different cases of hysterical paralysis.

(2) *Hysterical Anæsthesia Following Stupor.*

A condition of stupor was not uncommon in soldiers who were exposed to some exceptional emotional disturbance when their resisting power had already become lowered by prolonged exposure to terrifying experiences, especially if they were suffering from great physical fatigue, the result of strenuous exertion, want of sleep, and perhaps insufficient food. In this condition the patient's mind appears to be so absorbed with his own innermost thoughts that he gives no attention to the external world. He appears to see, hear, and feel nothing. He does not blink when a stick is waved in front of his face, nor jump when a loud noise is made just behind him. He pays no attention to tickling or to painful stimuli applied to his skin. Sooner or later spontaneous recovery occurred in most cases. After a period of confusion the patient became normal in every way, and his vision, hearing, and sensibility to all forms of cutaneous stimuli returned. In most cases the intermediate period of confusion was very short, but it was sometimes prolonged. If during this period the patient happened to be under a medical officer, whose clinical enthusiasm prompted him to make repeated examinations of his motor and sensory functions, the patient's dawning interest in the outside world was focussed on these functions, some deficiencies in which thus became perpetuated as hysterical symptoms. A very striking example of this was a patient who happened to be the subject of intense study by a number of neurologists in the early days of the war, when the true hysterical nature of so-called "shell-shock" was not fully understood. The sensory deficiencies natural to a condition of profound stupor were consequently perpetuated after the stupor disappeared, and resulted in the most complete and widespread hysterical loss of all forms of sensation, except hearing and seeing, which I have ever observed.

Total amnesia with hysterical paralysis, contractures, analgesia, and mutism due to emotional strain; recovery of memory after 22 months and from paralysis after 28 months.—Pte. M., aged 23, with no personal or family history of neurosis, was slightly wounded in the thigh in May, 1915, after serving from the beginning of the war. He returned to the front in October, 1915. He was quite fit until Feb. 19th, 1916, when he had to be forcibly prevented from going over the parapet to attack some German mortars which were firing at his trench. He then became dazed, and on reaching the aid-post he could not answer questions, but he obeyed simple commands, such as to put out his tongue. He believed he was still in the trenches, which were being heavily shelled; his eyes were fixed on imaginary trench mortar shells coming towards him. His knee-jerks were brisk, there was an extreme degree of pseudo-ankle clonus, but the plantar reflexes were flexor. The bowels and bladder remained under control. Two days later the knees and ankles had become stiff; the legs, hands, and face were anæsthetic and analgesic. When he reached England on March 2nd his expression was apprehensive, and he started at every sound, both when awake and asleep. In his dreams he saw the ghosts of Germans he had bayoneted come to take revenge on him, and he heard them fire at him. He was still unable to speak, but he answered questions by nods and signs, and in writing. He was able to walk with assistance. He was treated by hypnotism and the hallucinations disappeared, but his physical and mental condition rapidly deteriorated.

I saw him for the first time in December, 1916, 11 months after the onset. He could not speak, and all four limbs were now completely paralysed, except that he was able, with a great effort, to make slight movements at his left elbow-joint. An extreme degree of contracture was present: the legs were rigidly extended, with the feet plantar flexed; the arms were extended, and the fingers tightly clenched, though the metacarpo-phalangeal joints were extended. It was almost impossible to produce any passive movements, but the contractures were entirely hysterical, as they relaxed completely under an anæsthetic and during sleep. Total anæsthesia and analgesia of the whole body, including the conjunctiva, cornea, and buccal mucous membrane, were present, except that passive movements at the elbow were painful, and he occasionally suffered from toothache. The anæsthesia disappeared, at any rate to some extent, during sleep. Although deep pressure over the abdomen produced no sensation, the sensibility of the bladder and rectum appeared to be present, as he retained perfect control over them. The sense of taste and the sense of smell were obviously much impaired, and the fields of vision seemed to be greatly contracted, but hearing was abnormally sensitive, and the auditory-motor reflexes were extremely brisk. The conjunctival, corneal, and all skin reflexes were absent; when the contractures relaxed under partial anæsthesia the deep reflexes were found to be normal.

On Dec. 15th, 1916, vigorous suggestion with the aid of an intralaryngeal electrode during light etherisation restored the power of whispering. It was then found that the patient had total loss of memory; he had no idea who or what he was, he did not realise that his anæsthetic legs belonged to him, and he had no knowledge of the meaning of words.

During the following months he learnt to talk a kind of pidgin English, but the meaning of every word had to be taught, and he used each word in his limited vocabulary for a variety of meanings. All liquids were "tea," and when petrol was poured into the tank of a motor-car he was in he called out "Table has tea," table being for some obscure reason the name he applied to all vehicles. "Hand" represented a hand and a glove, and "to hand" was to hit. A word taught by other patients in fun would never be given up, so that all forms of meat, chicken, and fish were called "puss." His only numbers were one and six, which represented anything more than one, except a very large number, which was sixty-six, or a still larger number which was six-sixty-six. The sight of his own face in a mirror always terrified him: he did not realise who it was he saw, and turned his head away, saying, "No like you, chick." On seeing in the mirror the face of the sister who was standing by his side, he was greatly amused and said "See six sisters." All attempts to teach ideas of time, space, and colour failed, and he did not recognise any of his relations, even when his father was brought to him in the middle of the night in the hope that he might know him at the moment of waking. He remembered recent events and called people by names which he invented himself; a bald patient was "no-hair chick," and men who limped badly were "no-leg chick" and "six-leg chick"; all officers in uniform were "Major," and civilians "Mister," or, if friends, "Mister Chick."

In spite of treatment no improvement in the condition of his limbs had occurred by October, 1917, though he was able to sit up in a chair and enjoyed being taken out of doors. He delighted in childish toys, and in a general way his mind was that of a year-old child. He was quite happy, but he was becoming very emaciated; it was difficult to persuade him to eat, as he had completely lost the senses of taste and smell, and he apparently never felt hungry.

On Nov. 22nd, 1917, for no obvious reason, he had a headache and became excited in the evening. His memory began to return during the night and he talked incessantly. The next day he

realised the deficiencies in his speech and wished to have them corrected. When told a word he repeated it correctly and remembered it, and he began to form proper sentences. On Nov. 24th I cured a man suffering from hysterical aphonia with a laryngeal sound in his presence. Though this had failed on many occasions since he learnt to whisper nearly a year before, it now cured him instantaneously to his intense delight. He felt something snap in his head, and immediately afterwards he talked quite normally and the memory of his home and his past life flowed back. His father came the next day and he knew him at once. He soon remembered his experiences in France, but his life in hospital for 21 months was a blank, as it seemed to him that he was in France only a few days ago. He had a vague recollection of very recent events and he knew the men in the ward, but did not remember friends who had gone out only a week before. He remembered "feeling funny with a buzzing head," then "something in his head was suddenly relieved," and the buzzing stopped when his memory returned.

Complete anæsthesia and analgesia were still present, and the cutaneous, conjunctival, and corneal reflexes were absent. With his eyes bandaged the only difference he could recognise between hot and cold water, tea and beer was that the tea was "sweet" and the beer was "bitter." Salt was recognised as a powder, but without taste. Jelly was recognised, as it dissolved so quickly in the mouth, but butter was also taken to be jelly. Bread was indistinguishable from fish, and he could not recognise any difference whether it was spread with butter, mustard, or salt. Marmalade appeared sweet, but was not recognised; he guessed that chutney was apple.

His mental condition was now perfectly normal, but for some time very little improvement occurred in the condition of his limbs. With re-education the left arm slowly improved, but it was not until he was transferred to the Seale Hayne Hospital in April, 1918, that any marked change occurred. At the end of a fortnight his right arm, which had hitherto remained rigid and paralysed, had improved so much that he could write long letters, brush his hair, and feed himself, but all movements were stiff, shaky, and slow. The left arm improved at the same time, but there was still no recovery of voluntary power in the legs. On May 1st a renewed attempt was made to overcome the rigidity of his legs. This was so far successful that slight voluntary power returned in the feet. Steady improvement followed until all movements became possible, the adductor spasm of the thighs being the last to relax. By May 31st he could stand with very little assistance and could perform all ordinary movements with his arms, though some rigidity was still present. On June 2nd, his twenty-fifth birthday, he stood without support, and after being helped for a few minutes he walked without assistance round the quadrangle after having been paraplegic for 28 months. His physical condition now steadily improved, and by June 20th he was able to take charge of the basket-making shop. The sensibility of his skin and mucous membrane slowly returned without special treatment, but was still somewhat deficient in August. The superficial reflexes returned pari passu. Thus, the abdominal reflexes were absent so long as anæsthesia was complete. When at length a strong faradic stimulation could just be felt on the left side, a weak reflex appeared on this side. The right reflex only returned at a later date when the right side of the abdomen was no longer completely anæsthetic, but it was still weaker than the left, corresponding with the fact that sensibility was more nearly normal on the left than on the right side. In the same way the corneal and conjunctival reflexes returned with the return of the sensibility of the cornea and conjunctiva.

By September, 1918, recovery was complete. The last trace of contracture of the fingers and of unsteadiness in gait had disappeared. The patient had regained his weight and was in every way as fit as when he first joined the army. Since then he has remained perfectly well.

(3) *Hysterical Anæsthesia Following the Anæsthesia Caused by Injury to Peripheral Nerves.*

The paralysis and anæsthesia following an injury to a peripheral nerve, which is caused by the interruption in the nervous impulses passing between the central nervous system and the periphery, may both be perpetuated as hysterical symptoms when the interruption is no longer present.

A gunshot wound in the immediate neighbourhood of a nerve produces minute changes in its structure which quickly disappear, but, evanescent as these concussion changes are, they are none the less organic, and the paralysis and anæsthesia they produce are primarily of organic origin. The patient may at first make repeated attempts to contract the muscles supplied by the nerve, but, as he invariably fails, he finally discontinues and realises that the muscles are paralysed. If the true nature of the condition is recognised and the patient is encouraged to repeat his attempts every day, he will find in a very short time that his power is returning. If, on the other hand, the condition is misunderstood, and the patient is ordered treatment with electricity and massage, and is given to understand that he may have to continue with this treatment for weeks or months before recovery can take place, the original tendency to perpetuate the incapacity by auto-suggestion is greatly strengthened by the hetero-suggestion involved in the treatment, with the result that by the time the nerve has completely recovered the organic incapacity is replaced by an exactly similar hysterical incapacity. In the same way the primary organic anæsthesia is perpetuated as hysterical anæsthesia with all its characteristics unaltered, particularly if the patient's attention has been drawn to its extent and its exact nature by the thorough investigations of a keen and interested medical officer in the early stages when the condition was still organic. If the nerve is more seriously damaged, especially if it has been divided and subsequently sutured, the primary organic condition lasts for a longer period, and its characteristics are all the more likely to become vividly stamped on the patient's mind and to become perpetuated as hysterical phenomena when recovery from the actual injury at last occurs.

I am convinced that the voluntary power of paralysed muscles returns before the response to faradism when an injured or divided and sutured nerve is regenerating, an opinion which is shared by most observers. When complete paralysis has been present for many weeks it is natural that a man should cease to make an effort to move the affected part, so that it is extremely likely that he will not become aware of his returning power at the first moment that the regenerating nerve is capable of conveying motor impulses. If left to himself he will probably only make the discovery some weeks later, when a considerable degree of power has returned, and the normal electrical reactions are re-established. If he is receiving regular electrical treatment, the discovery of a response to faradism is likely to prompt the operator to tell him to make an effort to move, which will in all probability be successful owing to the suggestive effect of the ocular demonstration of the movement produced by the electricity. Under more favourable conditions the patient is seen frequently by the physician, who encourages him to make daily efforts to contract the paralysed muscles, with the result that the returning power is recognised at an early stage—frequently before there is any response to faradism. I believe that the exceptionally early recovery of function after nerve suture, which is occasionally observed, is due to the patient having discovered that he can contract the paralysed muscles within the first few days after the nerve has regenerated sufficiently for a few feeble impulses to be conveyed along it.

If from the beginning no attention is paid to the anæsthesia, it disappears spontaneously when the motor symptoms are cured. If, however, it has been carefully investigated, and its extent and nature have become thoroughly recognised by the patient, it is likely to persist as hysterical anæsthesia. It can then be cured almost instantaneously by the suggestive effect of the application of a faradic current, the patient being first told that his sensation will at once return when the electricity is applied. He quickly feels the electricity, and directly afterwards it is demonstrated to him that he can now also feel the lightest touch as well as pain, and can distinguish accurately between hot and cold. This immediate recovery with suggestion proves that the condition must be genuinely hysterical.

The exact area involved when the condition is no longer organic depends largely upon the intelligence of the patient and the interest he takes in the examination of his anæsthesia, and partly on the physiological and anatomical knowledge of the observer, who would be likely to influence the patient by his own ideas on the subject, both whilst the condition was organic and after it became hysterical, unless he was unusually expert in avoiding the liability to suggest what he expected to find. The following case is selected from several we observed in which hysterical anæsthesia showed a distribution exactly similar to that produced by an organic injury to a peripheral nerve.

Hysterical anæsthesia of the median nerve following a wound of the forearm.—Pte. B., aged 36, was wounded in the right forearm on Sept. 5th, 1918. His hand became paralysed and there was anæsthesia in the area of skin supplied by the median nerve. After being treated by massage for three months he was admitted to Seale Hayne Hospital under Captain S. H. Wilkinson on Jan. 20th,

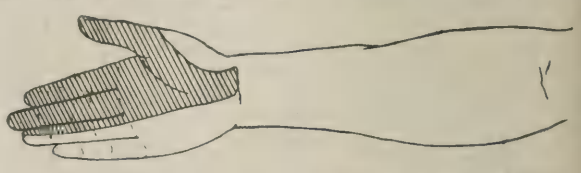


FIG. 7.—Hysterical anæsthesia in median nerve area.

1919. Hysterical contracture of his fingers prevented him from flexing them, and he complained of numbness of the thumb and the first two and a half fingers. (Fig. 7.) He was treated by percussion and re-education, and at the end of two days the motor power of his hand was normal. Sensation was then restored in a few minutes by suggestion with the aid of faradism.

Direct treatment of hysterical anæsthesia following a nerve injury is, however, often unnecessary, even if the patient is well aware of its existence, as it is sufficient to point out to him, as in the following case, that as soon as his power of movement returns the loss of sensation will disappear.

Spontaneous disappearance of hysterical anæsthesia of the ulnar nerve on recovery from associated paralysis.—Pte. B. was wounded in the upper arm on August 29th, 1918. He developed a contracture

of the ring and little fingers, and cutaneous anæsthesia of the area of the skin supplied by the ulnar nerve. He was transferred to Seale Hayne Hospital under Major J. F. Venables on Nov. 10th, 1918, with the ring and little fingers firmly flexed into the palm of the hand and with cutaneous anæsthesia in the area supplied by the ulnar nerve. The paralysis and contracture were treated by persuasion and re-education, and it was explained to him that as soon as he could move his fingers normally the numbness would go. In half an hour he was completely cured, the anæsthesia as well as the contracture having disappeared without any direct treatment by faradism or other form of suggestion.

In the following case the anæsthesia, though hysterical, was so profound that the patient injured himself without being aware of it at the time.

Hysterical anæsthesia of the median nerve, resulting in accidental injuries to the anæsthetic area.—Pte. I., aged 19, was wounded on Oct. 11th, 1918, in the left forearm. His arm and hand were put on a splint and he was transferred to England a week later. On Oct. 20th he tried to use a fork for the first time, and discovered that he could not feel it. He told his medical officer, who found that he had anæsthesia in the area supplied by the median nerve. He was transferred to Seale Hayne Hospital under Captain Wilkinson on Feb. 22nd, 1919, suffering from hysterical paralysis and contracture of the fingers, which were fixed in a semi-flexed position. The margin of the outside of the nail of the middle finger was ulcerated over an area the size of a shilling, and on the extensor aspect of the first finger there was another superficial ulcer. He stated that two days previously he had tried to get the feeling back in his fingers and thumb by holding them in front of the fire. He had been unable to do so, and had not been aware that he had burnt himself until the following morning, when he found large blisters had developed on his fingers.

On the morning of admission his hand was treated by persuasion and re-education, and at the end of half an hour he could open and close it quite strongly in a normal manner. The anæsthesia was treated by suggestion with the aid of faradism, and in a few minutes his cutaneous sensibility was completely restored. He had no further trouble with his hand, the ulcers rapidly healing, and a fortnight later he was discharged.

(4) *Hysterical Anæsthesia Following Cerebral and Spinal Lesions.*

The anæsthesia associated with the paralysis caused by disease or injury of the brain and spinal cord may be perpetuated as an hysterical symptom after partial or complete recovery from the organic lesion, in the same way as the anæsthesia associated with the paralysis caused by injury to peripheral nerves.

I have not, however, made many accurate observations on this subject, except in cases of spinal concussion in which total paraplegia followed a blow on the back. In such cases signs of organic paraplegia were often present at first, and anæsthesia was frequently discovered up to the level of the spinal segment which was principally involved in the injury. Both paralysis and anæsthesia sometimes persisted for months or even years after the organic lesion had so far recovered that it could no longer be responsible for any disturbances in the spinal functions. The paraplegia was almost always amenable to the rapid form of psychotherapy, in which explanation, persuasion, and re-education resulted in more or less complete recovery in the course of a single treatment lasting perhaps an hour. If no attention was paid to the accompanying anæsthesia at the time, it would always be found to have disappeared with the paralysis when a careful examination was made on some subsequent occasion. If, however, the sensory functions were investigated during the treatment they would be likely to persist and require further psychotherapy before they finally disappeared. A patient recovering from paralysis, which was the only symptom in which he was really interested, as it was the sole cause of his incapacity, would subconsciously expect any associated, but to him unimportant symptom, such as anæsthesia, to disappear when the paralysis disappeared, but if his attention was directed to his anæsthesia immediately before or during the treatment he might very well expect that a symptom which so greatly interested his physician would require separate treatment, and he would not recover spontaneously.

(5) *Hysterical Anæsthesia Following the Anæsthesia Caused by Peripheral Anæmia.*

Whenever the hands or feet of healthy individuals get abnormally cold, the anæmia resulting from the contraction of the peripheral vessels is accompanied by a feeling of numbness and diminution in the acuteness of cutaneous sensibility.

Individuals with a feeble circulation are particularly apt to get numb extremities in cold weather, and in Raynaud's disease a similar but much more severe anæmia with a greater deficiency of cutaneous sensibility occurs as a result of vaso-motor spasm, even when the weather is not unusually cold. A man with a poor circulation knows by experience that the best means for preventing attacks of peripheral anæmia is exercise, and that when his hands are becoming abnormally cold and numb, active movements may restore the circulation and cause the numbness to disappear.

It is natural that the immobility caused by paralysis or contracture of a limb, whether the latter is organic or hysterical, should result in deficient circulation, accompanied by numbness and anæsthesia. As the deficient circulation is continuous instead of intermittent, as in the physiological conditions already referred to, the anæsthesia becomes more profound, especially in individuals who have a feeble circulation. The anæsthesia may be so severe that the patient may burn himself without being aware of it, as in the case described below. When the circulation is temporarily improved by immersing the limb in hot water normal cutaneous sensibility returns, and in hysterical cases the improved circulation, which results from the recovery of mobility and disappearance of spasm under psychotherapy, is immediately followed by a return of normal cutaneous sensibility, even if the condition has persisted for months or as long as two or three years.

If, however, much attention has been paid to the anæsthesia which results from the poor circulation in hysterical paralysis and contracture, and its exact extent has been carefully mapped out on several occasions, the symptom takes such a prominent place in the patient's mind, instead of being one of which he is hardly aware, that it is very liable to be perpetuated by auto-suggestion when recovery from the paralysis and contracture takes place. The patient does not associate the anæsthesia with the diminished circulation, but regards it as an independent symptom, which will require separate treatment by re-education or suggestion after the paralysis and contracture have been dealt with. That the anæsthesia is purely hysterical when it persists after recovery from the paralysis is proved by its immediate disappearance with psychotherapy, although this has no effect so long as the paralysis is still present, as the anæsthesia is then a direct result of the peripheral anæmia, and is incapable of amelioration so long as the latter persists.

Hysterical anæsthesia following the anæsthesia caused by peripheral anæmia associated with hysterical paralysis of the hand.—Sergt. H., aged 23, underwent an operation on Jan. 18th, 1918, for the removal of a ganglion from the dorsum of his left hand. He was discharged to duty six weeks later, but two days after returning to work the hand became blue and swollen, and he was re-admitted to hospital. The swelling was lanced, a quantity of pus evacuated, and a splint and fomentations were applied. The wound had healed four weeks later, but the splint was kept on another fortnight. The patient then found that he could not move his fingers and that his whole arm was flaccid and useless. He was sent to the electrical department, and a few days later, while smoking a cigarette and holding it carelessly in his right hand, he brought the burning end close to his left hand. A comrade told him to be careful, but not before he had burnt his finger and caused a blister to appear. He felt no pain from the burn nor from the blister, and this was the first time that it had occurred to him that his hand was anæsthetic. He called the doctor's attention to it. The arm was examined and found to be somewhat wasted, but the anæsthesia was not investigated. A month later the patient was transferred to another hospital, and here the anæsthesia was tested for the first time and was found to extend as far upwards as the neck.

On admission to Seale Hayne Hospital under Captain W. R. Reynell on May 19th, 1918, complete flaccid monoplegia of the left arm was present, and the hand was blue, cold, and œdematous. Complete anæsthesia and analgesia were present over an area similar to that shown in Fig. 5. Treatment by explanation followed by vigorous persuasion and re-education was sufficient to restore the power of the muscles of the shoulder and upper arm in about ten minutes, but there still remained a very slight degree of wrist-drop, and the fingers and thumb could not be moved. After a second treatment lasting about half an hour the power of the fingers was so far restored that the grip on the dynamometer registered 110, and the blueness and swelling had completely disappeared. Two days later the grip was 140, and the patient took part in boxing practice. A fortnight after admission the grip was 180, which is above normal for the left hand, the grip with the right hand being 240. The anæsthesia, which had not altered in degree or extent, was now treated by direct suggestion with the aid of faradism; normal sensibility of the whole arm was restored in a few minutes.

It is clear that in this case the primary anæsthesia which led to the accidental burn was not hysterical. It was caused by the peripheral anæmia, with which the disuse resulting from the hysterical paralysis was associated. When the extent of the anæsthesia was investigated the examination resulted in its spread by hetero-suggestion, a large hysterical element being now present, as the peripheral anæmia could only account for anæsthesia of the hand and possibly of the forearm. The restoration of the circulation which followed the cure of the paralysis must have caused the anæsthesia due to the peripheral anæmia to disappear, but as most of the anæsthesia was already hysterical, this part also became perpetuated by auto-suggestion when the original cause was no longer operative. Consequently the whole of the anæsthesia was ultimately hysterical, and, being hysterical, was capable of being cured by psychotherapy.

In the rare cases in which the anæsthesia associated with hysterical paralysis and contracture appears to develop spontaneously in the absence of any medical examination, it is probably in the first instance due, as in the case just described, to the associated peripheral anæmia. It is thus not primarily hysterical, being only hysterical if it persists after recovery from the paralysis and contracture.

Diagnostic Significance
OF
NERVE SYMPTOMS IN ACUTE INFECTIONS.

Being the Harveian Society's Oration.

BY SIR THOMAS HORDER, M.D. LOND.,
PHYSICIAN WITH CHARGE OF OUT-PATIENTS TO ST. BARTHOLOMEW'S HOSPITAL.

MR. PRESIDENT AND GENTLEMEN,—I have chosen a subject for my address this evening which is topical because the first considerable outbreak of cerebro-spinal fever occurring in Great Britain in modern times has been followed more recently still by two large waves of epidemic influenza, overlapping more or less with an epidemic of encephalitis. These events have provided ample material both for investigation and forethought. And now a fair number of sporadic cases of all three of these diseases gives us opportunities for application of the lessons we may have learned and for revision of these lessons in so far as they have been too hasty by vice of the limited time at our disposal during the stressful period of the war. A difficult subject because I am anxious to give you, not merely a digest of other people's opinions, so much as a tentative presentation of my own experiences.

I. INTRODUCTORY.

The problem so frequently facing us, of a patient taken suddenly or acutely ill with a disease whose symptom-complex contains elements of a nervous kind, whether subjective or objective, and demanding careful investigation, is so familiar that I will not stay to dilate upon its importance. This problem forms the practical basis of my remarks this evening. It is not a problem essentially for the bacteriologist, though his help may be, and ofttimes is, invaluable. It is not a problem essentially for the neurologist, though his researches and his teaching are of great assistance in the diagnostic argument which arises from a study of the case. It is essentially a problem for the practitioner. Not only the patient and the patient's friends, but the bacteriologist and the neurologist also, wait upon him in such a case. In spirit and in outlook, and in the first instance, he must *be* the bacteriologist and the neurologist, though not necessarily in laboratory experience nor in technical knowledge. It is the practitioner who makes the first approach and who has the onus of attempting the first diagnosis. Few cases, if any, try his resources more thoroughly than patients of this class, and yet few cases reward him more for careful and methodical study. I can only hope to indicate this evening the bare lines upon which, as it seems to me, his thoughts may usefully travel when faced with the clinical material of actual practice.

I shall deal with the subject from two points of view: (1) the general or synthetical aspect; and (2) the particular or analytical aspect. Under the first heading I shall consider briefly what are the mechanisms, physiological and histological, by which nerve symptoms in acute infections are produced; under the second heading I shall consider these symptoms themselves and touch upon their diagnostic significance.

II. THE MECHANISM OF PRODUCTION OF NERVE SYMPTOMS IN ACUTE INFECTIONS.

Disease may be defined as the sum of the phenomena resulting from the interaction between the organism and various pathogenetic influences. The "acute infections" are diseases resulting from the interaction between the organism and pathogenetic microbes whose virulence is sufficient to cause rapid disturbance of normal functions in tissues which offer some degree of resistance to the attack. Prominent amongst these disturbed functions in many acute infections are those directly referable to the nervous system. The resultant of these nerve disturbances are what we term nerve symptoms and nerve signs. The mechanism by which disturbance of nerve functions is produced is not the same in all cases, and in order to get clear conceptions of the pathogenesis of nerve symptoms it is necessary to determine and to distinguish these mechanisms carefully, and to consider which one is present, or whether more than one, in each individual case presented to us.

When a pathogenetic micro-organism assists in causing an acute illness the complete sequence of possible events in respect of its activity includes a focus of invasion, a focus of primary infection, a state of general intoxication, a state of general infection, and a focus of secondary infection. Foci of secondary infection may further intensify the condition of general intoxication and of general infection. In a few diseases all of these processes may occur in fairly orderly and recognisable sequence. They may all of them be seen, for example, in some cases of streptococcus infection. The streptococcus invades the tonsil, a focus of infection arises here (acute tonsillitis), toxæmia results, septicæmia results, a secondary focus of infection takes place in the heart (acute endocarditis) and, finally, the streptococcus reinfects the blood stream from this secondary focus, intensifying the general intoxication. In those acute infections which we term "acute specific diseases" it is common to find a selected series of these possible processes brought into play, and the particular series is apt to be repeated again and again by particular microbes, leading to established disease pictures which are recognisable as such. In other words, diseases caused by certain infecting agents for the most part "breed true," and yield results which justify the use of the term "specific." But not always. There are imperfect instances in disease as there are in any other type of objects. For the most part, again, the "course" of acute specific infections is closely repeated in the majority of instances of the infection, so that the cases compare more or less closely at given stages of the disease process. But, again, not always. There are "immature" and there are "precocious" specimens; there are "gigantism" and "dwarfism"; there is even "progeria" or premature senility. But for simplicity we will confine ourselves to disease-types, and we will omit anomalies.

With these ideas before us, let us glance at a few diseases which exhibit marked nerve symptoms. In *diphtheria* the usual series of events includes a focus of invasion in the fauces, a primary infection at the site of invasion, and a state of general intoxication. In *pneumonia* the series includes an (obscure) invasion focus somewhere in the respiratory tract, a general infection with little or no focal infection, a rapid secondary infection in the lung tissue, and resulting general intoxication. In *cerebro-spinal fever* there is an invasion focus in the naso-pharynx but little or no infection here; invasion of the blood stream but rarely an infection of it; a primary infection in the pia-arachnoid membrane; and a state of general intoxication resulting from this systematised infection. (If it be true, as some authorities consider, that the passage of the microbe usually takes place directly through the lymphatics between the naso-pharynx and the base of the brain rather than through the blood stream, this does but extend the site of invasion; it does not introduce a different conception of the main series of events.) In *poliomyelitis* we postulate an invasion focus in the upper respiratory tract, an invasion of the blood stream, or, again, of the channels between this area and the central nerve-axis, a primary infection of the substance of the brain and cord, and a general intoxication from these tissues.

If these conceptions are justified, as I think they are with our present knowledge, it follows that nerve symptoms arising as part of the interaction already referred to are directly referable to one or more of three different processes by which the nervous system becomes implicated. These three mechanisms by which nerve symptoms are produced are—

1. *By toxæmia.*—Nerve tissues are affected by circulating toxins derived either from a focus of primary or of secondary infection or from a general blood infection. In this mechanism there is no actual involvement of the meninges or of the nerve tissues themselves.

2. *By infection of the meninges.*—As the result of primary or secondary infection inflammatory changes occur in these times and lead to one or more of three morbid pathological processes, either of which may produce nerve symptoms: (*a*) mere toxæmia resulting from the interaction in the inflamed membrane; (*b*) irritation and strangling of nerve-roots by the inflammatory products in the pia arachnoid; (*c*) the accumulation of cerebro-spinal fluid in the cerebral ventricles and in the cisternæ of the spinal cord whereby hydrocephalus and hydromyelia may result.

3. *By infection of the nerve tissues themselves.*—Inflammation takes place in the brain and cord, leading again to three different morbid changes, each capable of contributing its own quota of nerve symptoms: (*a*) changes occurring directly in the blood-vessels, such as thromboses and hæmorrhages; (*b*) inflammation and degeneration of the grey matter, and especially of the nuclei, resulting from the infiltrating vascular lesion; (*c*) secondary changes in the conducting nerve paths.

In the first of these three mechanisms the nerve symptoms manifested by the patient are chiefly "functional" in origin; in the second and in the third of these mechanisms the symptoms are chiefly "organic" in origin. The great significance of these mechanisms lies in this distinction.

Now the virus of each of the acute specific infections tends to set in action all three of these mechanisms, but the degree of this tendency varies with the particular virus. This is a fundamental conception taught by recent research in clinical medicine, in clinical pathology, in bacteriology, and in morbid anatomy. It is only by the combined study of all these methods of observation that we can learn to appreciate the total results of infection. *The selective affinities of "specific" micro-organisms are not absolute qualities of these agents, but only relative tendencies.* And they must be regarded as such during our deliberations as to what particular interaction is taking place in the patient and as to what particular microbe is giving rise to the disease.

A very pertinent illustration of the truth of the statement that microbic agents tend eventually to set going all three, and not merely one, of the three mechanisms by which nerve symptoms are produced, is afforded by fuller study of the cerebro-spinal fluid in disease, rendered possible by the more frequent performance of lumbar puncture in acute infections. It is found that changes in this fluid are much more common in the course of acute infections than was formerly supposed to be the case. Intermediate between mere toxæmia and actual meningitis we now recognise a state of things to which provisionally we give the term *meningism* or *meningismus*, a condition in which the correlative of intense nerve symptoms is found to be an absolute increase in the amount of the fluid, its existence under increased pressure, a slight increase in its protein content, and a slight increase in its cell content. These symptoms include headache, vomiting, delirium, convulsions, rigidities, and even coma. The condition is not very uncommon in pneumococcus infections in children, in measles, in acute streptococcus infections, and in some others. The symptoms are ofttimes considerably relieved, it may be wholly cured, by the drainage of the fluid incident to the puncture.

Another pertinent illustration of this same truth is yielded by recent experiences of poliomyelitis. Not a few cases of this disease give clinical evidence of involvement of the meninges as well as of the vessels of the underlying nerve substance. Rigidities may occur, and the clinical picture may resemble cerebro-spinal fever very closely indeed. So much so that these cases have been grouped under the term "the meningitic type" of poliomyelitis. In such cases examination of the cerebro-spinal fluid reveals changes that are intermediate between those found in meningism and those found in cerebro-spinal fever. In such cases there is post-mortem evidence for regarding the lesion as a meningo-encephalitis, and not as a mere encephalitis only. In the third place I may bring to your remembrance the old-established observation that the disease we term for convenience "tuberculous meningitis" has as its pathologico-anatomical basis in most instances considerable inflammation of the brain substance in addition to the characteristic involvement of the meninges, that it is, indeed, a meningo-encephalitis, a fact which explains the depth to which the brain functions suffer throughout the whole course of this fatal disease in the majority of the cases.

Making due allowance, as we certainly must, for this tendency of every microbic virus to set up nerve disturbances by all three of the processes described, we are yet able in a large number of instances of infection, and by a close study of the symptoms themselves, to predict the probable nature of the microbe concerned. And, inversely, given the identification of the microbe concerned, we are often able to predict the probable mechanism by which nerve symptoms will arise.

The mechanism of toxæmia is the one operative in *diphtheria* and *tetanus* in the great majority of cases. It is also that by which nerve symptoms arise in most cases of *pneumonia*, *typhoid fever*, *scarlet fever*, and *rheumatic fever*. Secondary infection of the meninges occurs not infrequently in *pneumococcus infection* and is relatively more common when the primary infection occurs in the middle ear. In *measles* the nerve symptoms are usually toxæmic, but the specific virus, though it causes meningism not infrequently, rarely causes a true meningitis. That it occasionally sets up an encephalitis or a myelitis, however, has been long recognised. In *mumps* an actual inflammation of the central nerve structures sometimes occurs, and recent experimental work suggests strongly that the virus in this disease has group affinities with the causative virus of poliomyelitis (M. H. Gordon). It is possible that the virus of *infantile cholera* has similar affinities.

Reference has been made already to the tendency in *generalised tuberculosis* for the mechanism of encephalitic as well as meningitic involvement to be added to that of a toxæmia. In *cerebro-spinal fever* the meningococcus attacks the pia arachnoid in primary fashion, and this is by far the chief mechanism of production of the long series of symptoms presented in the disease. In some of the more severe and prolonged cases, however, there is inflammation of the underlying nerve tissue, both cerebral and spinal, witness the not uncommon ependymal lesions seen post mortem, and the histological changes demonstrable in the cortex. In *poliomyelitis* and in *encephalitis*, be the virus identical or only possessed of group affinity, the primary infection is the central nervous system itself, through intimate vascular infiltration. The mechanism of production of the symptoms in these diseases involving structural changes in the master tissue, it is not surprising that the symptoms are profound and of extremely serious import.

The nerve symptoms present in *influenza*, though protean in nature, are probably due in the main to a toxæmia, which may be of any degree from mild to intense; meningism is not uncommon; meningitis is rarely present in my experience, since I do not regard those sporadic cases of meningitis in which Pfeiffer's bacillus is isolated from the cerebro-spinal fluid as having any necessary association with influenza; encephalitis undoubtedly occurs in some of the fulminating cases during an influenza epidemic.

III. THE SIGNIFICANCE OF PARTICULAR NERVE SYMPTOMS IN ACUTE INFECTIONS.

Passing now to particular nerve symptoms, I propose to review briefly those commonly met with during the examination of patients suffering from acute infections and to offer certain considerations bearing upon their diagnostic significance.

(i.) *Facies, posture, and temperamental state.*—It is scarcely possible to note these points too carefully or to analyse them too closely. It is here, perhaps, more than anywhere, that the eye of the experienced practitioner is of invaluable service. Too often this series of observations is wholly overlooked, or only considered when some rather glaring feature strikes the doctor's attention, whereas it should be made a matter of routine practice, just as are the pulse, the tongue, and the temperature. In some cases the picture is so

clearly outlined that its significance cannot escape notice. The picture of excruciating pain shown in all its intensity by features which are contorted by the spasm of tetanus reveals quite clearly the nature of this infection. The child curled up beneath the bedclothes, peevishly shaking off the nurse who comes to tend it, or suddenly crying out in the stillness, or picking its lips and teeth with monotonous persistence: the question of tuberculous meningitis comes at once to the mind. The apathetic listless facies of the typhoid patient, lying low in bed, with tremulous hands, muttering, but with no visible signs of distress, is almost as decisive. The young man lying on his side, a bluish flush upon his face, his head thrown slightly back and limbs drawn up, staring for hours before him, resenting interference—such a picture takes us a long way towards a diagnosis of cerebro-spinal fever. And, of late years, the "mask-like immobile facies, with half-open eyes, the patient not so much in real sleep as sleep is indicated to the observer by the expression of the patient," add possibly a ptosis or a squint, and we are familiar with the picture as highly suggestive of encephalitis.

These are, however, as I have said, easily recognisable clinical pictures, because they are drawn with definiteness and with precision. We must train ourselves to the dimmer outlines, to the impressionist substitution for the completed work of art. But these lesser degrees of facial, postural, and temperamental change baffle description; they must be seen to be identified.

(ii.) *Headache.*—This is the commonest of all the individual nerve symptoms with which we are here concerned; and it is probably the least specific in diagnostic value. So constant a symptom is it in nearly all acute infections that to many it may seem almost valueless for differential purposes. And yet a critical analysis of its features is called for in every case, for it is only by giving the symptom this degree of attention that we obtain a hint of the mode of its production and the nature of the infecting agent. It is necessary to consider the headache in its intensity, its distribution, its persistence, its synchronism with other nerve symptoms, especially with delirium, its course, and the effect upon it of palliative remedies. In the matter of intensity there is little doubt that the headache of meningitis may be the most severe with which we have to deal. Approaching it most nearly is the headache of high grades of toxæmia, especially of typhus, typhoid, and influenza. In encephalitis the headache is rarely so severe as in meningitis. Steady persistence of the headache at the same level of intensity is also suggestive of meningitis; so, too, is the continuance of the headache as the course of the disease progresses. In influenza the headache rarely maintains the level of its early intensity past the third or fourth day; in typhoid it usually disappears completely or moderates very considerably with the onset of the "typhoid state." In most acute toxæmic states it may be said generally that the intensity of the pain is greater during the onset and early stage of the disease than later. As to distribution, in meningitis there is sometimes a marked concentration of the headache in the occipital region, but when this is so the rest of the head does not usually escape. In influenza the post-orbital and frontal regions are frequently complained of bitterly, other regions often suffering little or not at all. In typhoid the headache is sometimes an intense hemicrania.

Synchronism of headache with delirium has been a valuable diagnostic observation ever since Jenner pointed out the fact that such synchronism almost invariably indicates organic brain disease. Children often show this synchronism by uttering a painful cry, and adults by obvious delirium concerning their headache. In toxæmias, on the other hand—in typhoid and influenza notably—the headache departs with the onset of delirium. It is a common experience to see the typhoid patient racked by headache during the day and muttering quietly and more or less peacefully during the night.

Remedies, whether by local applications or by drugs given internally—unless opiates be administered to the point of physiological doses—usually fail to relieve the headache of meningitis, but they very often ameliorate the pain in toxæmias.

(iii.) *Neuralgias* are more common, in my experience, at the onset and during the first two or three days of some acute infections than is to be inferred from text-book literature. I have been struck by the frequency of their occurrence in encephalitis and poliomyelitis particularly. The nerves affected have most often been one or other branch of the trigeminal or the great occipital. The pain may be exceedingly severe, so as wholly to dominate the clinical picture. These focal pains may precede the headache by some hours. Similar intense neuralgias occur in cerebro-spinal fever also during the early stage. But since influenza and typhoid share this tendency to intense neuralgic pains, though in less degree, care must be exercised not to deduce from them the presence of an organic disease of the nervous system. The point of great practical importance is to remember that their presence may indicate the early stage of a general infection of considerable severity, and therefore help the observer to further examination from this point of view.

(iv.) *Vomiting*, if it occurs at the very commencement of an acute infection, has little or no special significance; it is common to the great majority of fevers—though more common in some than in others—and indicates, with a rigor or a convulsion, with the initial headache and with the malaise, the general invasion of the body by the virus. Vomiting that is repeated after the first day, however, or vomiting which appears after the second day or so, not having occurred at the period of general invasion, has definite differential value, raising the question of organic brain disease, especially meningitis. If the vomiting recurs day after day, the diagnostic value of the symptom is enhanced. There two acute infections in which vomiting of this character has not such special significance. One of these is diphtheria, in which the mechanism of its production has been thought to be a vagus neuritis; the other is severe influenza. In both of these conditions, but especially in the former, the symptom is a bad prognostic.

(v.) *Delirium.*—The features of a delirium should be investigated as critically as those of a headache. Before judging of the significance of delirium in any patient it is well to inquire carefully into the past history and also into the family history. As some persons tend easily to headache, and others are almost immune, so is it with delirium. Delirium may replace headache altogether in patients whose family history includes a psychopathic strain. I have seen such a person become suddenly delirious with the onset of typhoid fever of quite ordinary severity, and entirely miss the least suggestion of headache. Little children, of course, do not suffer from delirium in the true sense of this word, because their minds are not sufficiently developed to make delirium possible. The significance of synchronism and alternation respectively, of delirium and headache, has been referred to already. The period in the disease at which the delirium develops is an important differential point. In typhoid delirium rarely occurs before the tenth day, whereas in meningitis, even in cases of moderate intensity, it may be present from the first. So also in encephalitis. There is an important point of distinction between typhoid and meningitis on the one hand, and pneumonia and influenza on the other; that in the former two diseases there is little necessary relation to be observed between the delirium and the severity of the disease, and in the latter two diseases this relation is usually well marked. As to the character of the delirium, it is generally of a quiet type in typhoid, and not associated with restlessness; in pneumonia and in meningitis, however, this asthenic feature is conspicuously absent. This difference is probably related to the fact that, whereas in typhoid headache and acute discomfort disappear when delirium supervenes, in meningitis the intense headache is still

persisting, and in pneumonia the respiratory distress and the dilating heart are contributing to make the delirium loud and active. A sthenic delirium in typhoid generally means either that the patient is a psychopath, or that he has a secondary meningitis, or, as has been once or twice recorded, he has lost blood profusely by intestinal hæmorrhage, leading to a maniacal state from cerebral ischæmia.

(vi.) *Coma and allied states.*—Coma has always been regarded as a worse prognostic than delirium, and this opinion is borne out by the knowledge that in an acute infection coma is much more suggestive of involvement of the meninges or of the brain tissue than is delirium. Deep coma, from which the patient cannot be roused, is very likely indeed to indicate a meningitis. An appearance of sleep—*lethargy*—from which it is possible to rouse the patient for the purpose of examination and questions, the while he tends to fall back again into a state of apparent somnolence, we have learned to associate with inflammation of the brain substance; it is the feature which has led to the name *encephalitis lethargica* for those cases occurring recently in epidemic form in this country, in America, in France, and elsewhere. Whether these cases have been due to the virus of poliomyelitis or to some closely allied virus is still a matter of investigation. A state of *stupor*, which is neither coma nor lethargy, is very common in severe cases of cerebro-spinal fever and when associated with mental irritability and resistance to examination constitutes a very recognisable picture in this disease. A special kind of stupor is the condition termed *coma-vigil;* it is almost confined to cases of severe toxæmia, and especially typhus and typhoid; it indicates a very grave degree of the acute asthenia of infection.

(vii.) *Muscular hypotonus and hypertonus.*—The state of flaccidity or of rigidity which is often so conspicuous a part of the general facies requires special attention. In most toxæmic states the tendency of the musculature is towards diminished tone—typhoid, influenza, pneumonia, pyogenetic infections generally. The onset of meningism, however, as a complication in either of these infections abolishes this hypotonus. In encephalitis hypotonus is a very marked feature after the first two or three days, excepting the type of the disease termed the meningitic type. In cerebro-spinal fever the condition is the antithesis of this, hypertonus being present, and leading to those rigidities which have come to be regarded as cardinal points in the diagnosis: stiffness of the neck, with a tendency to retraction, tautness of the hamstrings giving rise to Kernig's sign, and other manifestations of the same general state.

(viii.) *Focal paralyses and pareses.*—These are perhaps the most conclusive of all nerve symptoms pointing to direct involvement of the nervous system in acute infections. When present in the early stage of such a disease they suggest strongly that the infection has already set up changes in the cerebral or spinal centres; in other words, that an encephalitis or a myelitis is present. We therefore make a special examination of the eyes for internal or for external ophthalmoplegia, and for ptosis, partial or complete. A complaint of diplopia, whether made by the patient to the doctor, or recorded by an intelligent relative, is never to be passed over lightly, for even if no strabismus is found on examination the occurrence of transient double vision is highly significant. An entirely fresh examination must be made at each visit to a patient suspected of an encephalitis, because these pareses of the eye muscles come and go, but do not thereby lose in significance. It is estimated that some form of ocular palsy, if we include ptosis in this term, occurs in over 70 per cent. of all cases of encephalitis. No doubt the greater frequency of squint in meningitis when it is due to the tubercle bacillus than when it is due to the meningococcus, is explained by the fact that the mechanism of an actual encephalitis is more often superadded in the former than in the latter infection.

Critical examination of the face, and especially of the mid-facial movements, is equally important, taking care to secure absolute symmetry of the patient's head and equal illumination on both sides during the investigation. The limbs are subjected to similar observation for evidence of weakness, both as a whole and in regard to muscle groups. A doubtful diagnosis of encephalo-myelitis may be definitely established now and again by finding polar effects emerge as the course of the disease proceeds—a weak hamstring or quadriceps group, a foot-drop or paresis of the abductor indicis or muscles of the thenar eminence in one hand.

(ix.) *Changes in the reflexes and tendon-jerks.*—These call for great discrimination, and not a little forbearance, in their interpretation. The reasons for this are two: with the exception of the knee-jerk, and perhaps also of the ankle-jerk, there is no constancy in regard to their presence in health in certain persons; on this account the criteria by which we judge the significance of the absence of the "reflexes" in disease are by no means strict; but, secondly, almost any severe toxic process may cause the reflexes to disappear, and this applies especially to the tendon-jerks. In typhoid fever, for example, and in severe pneumococcus infection, myotatic irritability may be much reduced and the knee-jerk may be unobtainable. A third factor comes into play and adds to the difficulty, and that is our inability at times, when the patient is very acutely ill, to apply the reinforcement method customary in cases of less severe illness when the knee-jerk is not obtained by the ordinary method. Two signs, however, are extremely helpful when they are present, and in both instances they are strongly suggestive of organic disease of the nerve centres or conducting paths of the cord: (1) asymmetry in the reflexes on the two sides, and (2) variations in the reflexes from day to day. I have been struck of late by the variations—vagaries, I might almost say—of the reflexes in some cases of poliomyelitis and polio-encephalitis during the stage of the disease following upon the general febrile disturbance. To-day the knee-jerks may be present, to-morrow absent, the third day exaggerated—perhaps with true ankle-clonus superadded—two days later the clonus may have gone and the knee-jerks may be difficult to obtain. The same remarks apply to the plantar response: on one day it may be flexor, upon another extensor, and then again it may revert to its normal type. And with these vagaries in the quantity and quality of the reflexes lack of symmetry may coexist, showing variations no less marked and no less rapid. I believe that these observations, if present, are highly diagnostic of encephalo-myelitis.

In meningitis, for the most part, a state of hypertonus exists, owing no doubt to the irritation of the nerve roots by the inflamed pia-arachnoid and its extensions forming the sheath of these roots. It is not, therefore, surprising that in the majority of cases of cerebro-spinal fever the knee-jerks persist or become exaggerated. Owing to the fact, already observed, that in most acute toxæmic cases likely to be mistaken for cerebro-spinal fever the knee-jerk is temporarily abolished, I usually consider that their retention, still more their increase, in any doubtful case, favours the diagnosis of cerebro-spinal fever.

(x.) *Intolerance of light and sound.*—I have learned to attach very little importance to these symptoms in acute illnesses for any diagnostic value they possess. I am aware that *photophobia* is regarded as an important indication of possible meningitis by many, but I believe it to be much more an indication of the severity of a headache and of the general nerve disturbance than a feature of any distinctive significance. I was once asked to go to the country urgently to see a woman suffering from high fever, intense headache, and photophobia, and was commissioned to bring the materials for lumbar puncture because the diagnosis of meningitis was almost certain. When I arrived the patient was in a darkened room, an ice-bag had been applied to her head, the nurse was walking noiselessly in the room, and my request that the patient should open her eyes so that I might see them was met by a statement that this was not possible on account of the extreme photophobia. I passed on to an examination of the legs, and I found

the cause of the phrenitis: a very acute streptococcal infection on the dorsum of a foot, with livid red streaks of lymphangitis spreading from it. The woman had been bitten by a gnat at this spot whilst playing tennis two days before. The rapid and satisfactory response to treatment made it certain that no meningeal complication had taken place.

The more severe the headache and the more ill the patient—short, of course, of coma—the more intolerant are the senses of sight and sound. Beyond this I do not think these symptoms take us.

(xi.) *Sphincter troubles* occasionally offer a differential element of no slight import. Retention of urine may be the first symptom of acute poliomyelitis. I remember the case of a young cadet in whom it existed for a whole day and night before he felt ill enough to report himself sick; two days later he was laid up with fever and severe pains in the head, back, and limbs, and on the fourth day he had focal paralyses in both lower extremities. The occurrence of retention of urine as part of the invasion-symptoms of an acute illness should always suggest this disease. It is rare, I think, in cerebro-spinal fever at the onset, unless, of course, the case is a fulminating one and the patient is already comatose when the examination is being made. In the toxæmic states of influenza and typhoid it must be very rare.

(xii.) *Deafness* is a not infrequent symptom quite early in typhoid fever, or developing during the course of the disease. The mechanism of its production is not clearly defined, but it is probably a toxæmic effect upon the auditory centre. In cerebro-spinal fever, deafness, if it appears, is usually late, and is very apt to be a permanent sequel. It is almost certainly due to the strangling of the auditory nerve roots by plastic exudate and thickened meninges. In typhoid fever it nearly always disappears, with defervescence of the fever. In other infections, if deafness be present, it is due to infection of the middle ear, and the course of the symptom depends upon the course taken by the otitis media.

(xiii.) To these focal palsies we may add *aphasia*. Care needs to be exercised in its interpretation when present, which is but seldom, in an acute infective process. It is an old observation that it may occur in typhoid. I know of no other toxæmic state in which it occurs—the aphasia and headache of a severe megrim occasionally confuse the observer—so that its presence in a doubtful case should raise the question of tuberculous meningitis, for in adults this disease may be ushered in by aphasia. Children, it will be remembered, do not show this symptom.

I think it sufficiently obvious that the limits of clinical observation in this subject, as in others, have not been reached. It is probable that they never will be reached. The careful analysis of the symptom-complex is called for more and more on the part of all of us, and the process carries with it results of great practical value.

THE INTRAVENOUS USE OF ACETYL-AMINOPHENYL SALT OF ANTIMONY (STIBENYL) IN THE TREATMENT OF HUMAN TRYPANOSOMIASIS AND KALA-AZAR.

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IN this paper I propose to recount recent experiences with the injection of an organic compound of antimony which may in the future have an influence upon the treatment of these two protozoal diseases.

History of the Therapeutic Use of Antimony Salts.

Antimony salts were first proposed for use in trypanosomiasis by Nicolle and Mesnil[1] in 1906; the following year Plimmer and Thomson[2] noted the sterilising effect of injection of potassium and sodium antimonyl tartrates in rats experimentally infected with trypanosomes.

The intravenous injection of tartar emetic in trypanosomiasis was first successfully undertaken by Broden and Rodhain[3] on the Congo from 1906 to 1908.

In 1910 Kerandel,[4] having himself unfortunately contracted the disease, after trying atoxyl in vain, reported the successful treatment of his own case by intravenous antimony tartrate. Since that date cases at the London School of Tropical Medicine have been treated with a considerable degree of success by a combination of atoxyl given by the intramuscular and tartar emetic by the intravenous route.

The treatment of leishmaniasis by antimony salts was first attempted by Vianna and Machado[5] in 1913 in two cases of dermal leishmaniasis in Brazil. In 1914 and 1915 we find antimony tartrate being used in the visceral form of leishmaniasis, or kala-azar by di Cristina and Caronia[6] in Italy.

More recently tartar emetic has been used with success in India by Rogers,[7] Mackie,[8] Muir,[9] and by Low[10] in this country. Rogers[11] has noted that the maximum dose of this drug should be reached very gradually and should be approximately 2 gr. for an adult in a 1 per cent. solution given every third day over some two or three months.

Latterly Rogers[12] has given up using tartar emetic in favour of sodium antimonyl tartrate, finding that the latter salt can be better tolerated and given at more frequent intervals. The solutions must be made up freshly before each injection, as if kept in stock they are apt to decompose and elaborate toxic products. A considerable stimulus to the use of intravenous antimony was given by the work of Christopherson[13] upon the cure of bilharziasis by tartar emetic, both with regard to the impunity with which the drug may be pushed in that disease and the large amounts which may be given in a comparatively short period (25 to 30 gr.) within three weeks.

Objections which have Arisen in the Use of Tartar Emetic in these Protozoal Diseases.

In the treatment of kala-azar and trypanosomiasis certain objections have been founded on the intolerance which some persons exhibit towards this drug, as well as the alarming reactions which have sometimes been found to follow the use of antimony tartrate in these protozoal diseases. Rogers has recorded three deaths following its use and Low[14] has noted the large amounts —64¾ gr. over a period of four months—necessary to cause destruction of the Leishman-Donovan bodies. Daniels and Newham[15] record the successful treatment of Rhodesian trypanosomiasis, in which very large doses of tartar emetic—over 500 gr.—were injected over a period of two years, showing that the extermination of these trypanosomes by antimony in this form is a slow process, affording the parasites in the meantime ample opportunity to cause permanent damage to the brain tissues.

The symptoms attributable to the direct toxic effect of antimony tartrate upon the human body may be classified as follows:—

(*a*) *Gastro-intestinal.*—(1) Coughing and retching at time of injection, accompanied by choking sensation in pharynx. (2) Nausea and vomiting immediately after injection. (3) Delayed vomiting, commencing four to five hours after injection. (4) Acute diarrhœa lasting 24 hours.

(*b*) *Cardiac* (in trypanosomiasis). (1) Cyanosis. (2) Rapid and irregular pulse.

(*c*) *Cerebral* (especially in trypanosomiasis). (1) Loss of consciousness. (2) Incontinence of urine and fæces.

(*d*) *Arthritic* (in bilharziasis). (1) Pain in one or both shoulders commencing one to two hours after injection. (2) Acute arthritic pain prohibiting movement in all the large joints of the body accompanied by intense lumbar pain, commencing six hours after injection and lasting for the subsequent 48 hours, noted in a recent case.

The maximum individual dose of antimony tartrate I have given is one of 2½ gr. (0·16 g.).

It is evident, then, that the discovery of an organic antimony compound, bearing the same relationship as salvarsan to arsenic, less toxic to human beings, but more specific for these protozoal parasites, should be aimed at.

Favourable Results from the Acetyl Salt of Antimony.

In 1916 Caronia[16] published an account of the successful treatment of leishmaniasis in young children with a new organic compound of antimony termed acetyl-p-aminophenyl-stibiate of sodium, prepared by the chemical firm of Heyden in Dresden. The salt contained 38·5 per cent. of antimony, and was soluble (1·20) in distilled water. The maximum dosage for children under two years by the intramuscular route was 0·1 g., and in children over that age 0·15 g. The

injections were made on alternate days into each buttock—a total of 3·6 g. being given in a period of three months. In one case intramuscular abscesses following the injection were noted.

My attention was drawn to this drug by a note by Dickinson[17] in THE LANCET for Sept. 6th, 1919, and since February, 1920, a supply has been procured through the good offices of Messrs. Allen and Hanburys. Considerable improvements have now been effected in its composition, with the result that a product termed "Stibenyl" has been evolved. This latter salt contains 34·3 per cent. of antimony, is soluble in ten parts of water, contains no trace of inorganic antimony, as in the first samples procured; it is non-toxic to mice in the dose of 0·2 mgm. per kilo weight, and, as far as has been ascertained at present, is easily tolerated by man in individual doses of 0·6 g. Possibly further experience will show that still larger doses may be given to man with impunity.

Treatment of an Intractable Case of Trypanosomiasis (T. gambiense) *by Stibenyl.*

The history of this case, which presents many features of interest, may be summarised as follows:—

E. W. S., 35, became infected with trypanosomiasis in the Belgian Congo towards the end of 1915. His illness commenced acutely on Jan. 26th, 1916, when he became unconscious, with a temperature of 103°F. Although the patient presented all the clinical symptoms of acute trypanosomiasis, yet these parasites have been very scanty in the blood during the last four years; the last occasion on which they were found in the blood-stream was in June, 1919. The cerebro-spinal fluid has been examined and found to be negative throughout. The excellent notes by Dr. W. E. Masters which accompanied the case record a general painful cervical and axillary adenitis, deep muscular hyperæsthesia (Kerandel's sign), and a fugitive circinate rash, together with pyrexia, slight anæmia, and constant headaches. An intolerance to tartar emetic even in minimal doses was noted at an early date. Admitted to the Albert Dock Hospital on April 4th, 1917, he has been under observation there up to the present moment. For brief periods he has been treated as an out-patient and injected with atoxyl, but from June, 1918, to July, 1919, he was an in-patient and systematically treated with intravenous injections of tartar emetic. He was permitted to return to his home for two months, but had to be readmitted on account of recurrence of symptoms in September, 1919.

During the long period of observation he has exhibited but few symptoms of actual toxæmia. The clinical picture has been one of progressive mental and cerebral degeneration. From time to time he has exhibited a slight pyrexia of 99°–100°, but sharp bouts with rigors have been noted only after intravenous injections.

He has been extremely sensitive to antimony tartrate, and there has been no possibility of giving it in larger doses than 1 gr. at four-day intervals. The maximum dose ever exhibited was 1·25 gr. Vomiting and collapse often ensued upon the injection of 3/5 gr., and on occasions the reaction was very severe. Thus once (July 4th, 1919) he became comatose and cyanosed, with an imperceptible pulse, a condition from which he only gradually recovered after two days. Subsequently his condition became so alarming that this form of treatment had to be entirely suspended.

Towards the end of 1919 and beginning of 1920 his condition became progressively worse. He was confined entirely to bed. Muscular weakness and incoördination were considerable. His pulse frequently became feeble and irregular, and, most significant of all, he developed incontinence of urine and fæces, soon followed by epileptiform fits accompanied by screaming, enuresis, biting of the tongue, complete unconsciousness and conjugate deviation of the eyes to the right. Three of these fits were recorded—Jan. 12th, March 1st and 2nd, 1920. Each fit lasted 10–20 minutes, after which he had a paresis of arms and legs lasting for three or four days.

Up to the last date he had been treated with a total of the following drugs during four years:—55 gr. of intravenous tartar emetic; 25 gr. of soamin, intramuscularly; 48 gr. of atoxyl, intramuscularly (finally discontinued on account of threatening blindness).

On March 5th, 1920, injections of stibenyl were commenced, at first in a dose of 0·1 g. working up to a maximum of 0·3 g. From that date up to June 1st he has had a total of 4·5 g. No untoward symptoms have been noted and the improvement has been progressive. On April 21st he commenced to get out of bed and since then he has gradually accumulated strength and mental equilibrium, so that now he has been able to leave hospital and return home for a short period. It cannot be said that his nervous system is now normal, though there is no evidence of any serious lesion. His gait is somewhat uncertain and he walks with his head bowed and the expression of his face is mask-like. All reflexes are increased, otherwise he is in good condition, he eats and sleeps well, and takes an interest in life.

Naturally it is impossible to say at present whether symptoms may not recur at some future date, but the remarkable improvement which has taken place latterly can only be ascribed to the action of this organic compound of antimony. Improvement commenced directly the drug was substituted for tartar emetic, and he was able to tolerate an injection of stibenyl at least four times as great as the maximum dose of tartar emetic ever given him, and within two months he had more antimony when given in this form (69·3 gr.) than in the whole of the previous four years.

It may be argued that the remarkable improvement which has taken place is merely one of those mysterious lucid intervals which have been noted in cerebral trypanosomiasis, but it must be remembered that, when the treatment with stibenyl commenced, a fatal termination appeared imminent; previous experience has shown that a case of trypanosomiasis which develops epileptiform fits proves invariably fatal. It is possible that the trypanosomes remained hidden in the cerebral substance in this case, as suggested by the work of Stevenson,[18] and therefore could not be demonstrated in the peripheral blood.

Successful Treatment of a Case of Kala-azar by Stibenyl.

History of the case.—A Goanese lascar, aged 20, was admitted to the Albert Dock Hospital from a B.I. steamer on April 3rd, 1920, with a history of continuous pyrexia for the previous two months. On admission he was found to be severely ill with a remittent temperature of 102–103°F., and from his physical signs the illness was first thought to be pneumonia, but as the pyrexia continued after disappearance of pulmonary signs the diagnosis was obscure. Subsequently he was transferred to the Tropical Diseases Hospital, Endsleigh Gardens. Soon a swelling appeared in the left hypochondrium and extended three fingers' breadth below the umbilicus in a downward direction; posteriorly it could be mapped out in the region of the scapula; in an upward direction it displaced the apex beat of the heart to the third intercostal space. Soon the tumour, which was extremely tender, could be distinguished as the spleen. The liver was enlarged slightly upwards and downwards, 1 inch below the costal margin. The blood count was at first by no means typical of kala-azar; the red cells numbered 3,500,000; leucocytes 7500, and the large mononuclears totalled but 4 per cent. The hæmoglobin was 50 per cent.

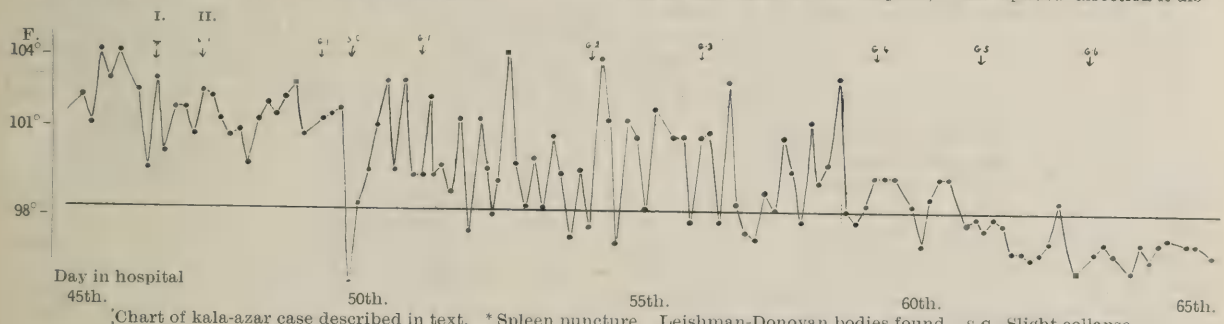

Chart of kala-azar case described in text. * Spleen puncture. Leishman-Donovan bodies found. S.C., Slight collapse. G., Gramme (stibenyl injection). I., Diagnosis made. II., Treatment commenced.

On May 8th, 1920, numerous Leishman-Donovan bodies were found by spleen puncture and were subsequently cultured on N.N.N. medium (Dr. J. Gordon Thomson). At this date the blood changes were much more characteristic of kala-azar, a leucopenia of 3500 with a mononuclear rise of 14 per cent. The pyrexia in the meantime assumed an intermittent type with frequent double rises to 103° and 104° during the 24 hours. The patient had become extremely emaciated and feeble, being hardly strong enough to turn in bed.

On May 19th, treatment with stibenyl commenced, consisting of intravenous injections on alternate days, the first dose being 0·1 g. and working up to a maximum of 0·6 g. With the exception of slight collapse following the second injection, no untoward symptoms have been noted. The improvement of the patient has been remarkable, and, after a total of 2·3 g. (35·4 gr.), his temperature has fallen to normal within 14 days (see Chart). The spleen has receded within the costal margin, and is now scarcely palpable. His general condition has steadily improved. On June 4th his spleen was again punctured, but only two Leishman-Donovan bodies were found in numerous preparations, and one positive culture was obtained. He is now up and about and gaining in vigour every day. He has had no further treatment and up to date (July 17th) has put on over 28 lb. in weight. His blood has improved considerably, the hæmoglobin now being 75 per cent., red cells 4,125,000, whites 6000, and mononuclears 4 per cent.

There are no signs of any relapse at present, but naturally it is intended to keep him under observation for a lengthy period.

Remarks.

The important points in this case are the extremely rapid action of the drug and the almost complete absence of any toxic symptoms after injection of 0·6 g. (9·24 gr.). There is little doubt in my mind that the patient has been cured, and in a remarkably short time.

Acetyl-p-aminophenyl stibiate of soda (stibenyl) is a brownish powder, easily soluble in water. The resulting solution is slightly yellow. Larger amounts, such as 0·6 g., are dissolved in 30 c.cm. of distilled water and injected by the open method. The vein should be flushed by a preliminary injection of saline. No irritating effects of the salt at the site of injection have been noted. The symptoms of a reaction following the second injection of the drug when much larger ones were subsequently tolerated with impunity may possibly be ascribed to the too rapid plasmolysis of the parasites and consequent liberation of their toxins. It is necessary that one should distinguish between a reaction of this sort and symptoms due to the toxic effect of antimony itself.

There has been a complete absence of any toxic phenomena—no vomiting, cough, nausea, or præcordial pain—as often noted after injection of the tartrate.

It is interesting to note that stibenyl is without effect upon benign tertian malaria. Two cases have been tried, and continue to have typical rigors on alternate days after 1·4 g. of the drug. Curiously enough, it appears to have no effect in bilharziasis. One case of urinary bilharziasis continued to pass living ova after 4·5 g. (68·3 gr.), but was subsequently cured with 16 gr. of tartar emetic.

While admitting that my experience has yet been small, owing to the paucity of suitable cases, the favourable results recorded, and the large doses of the drug tolerated, suggest that by combining organic chains with antimony in this manner a preparation has been evolved more specific than any yet employed for leishmaniasis. The experience already gained warrants a more extensive trial in an endemic area of kala-azar.

My thanks are due to Dr. A. L. Gregg, medical superintendent, Tropical Diseases Hospital, and to Dr. G. B. H. Hawes, formerly house surgeon at the Albert Dock Hospital, E., for the care they have taken with these cases. I must express my indebtedness to Dr. C. W. Daniels for permitting me to make use of his notes of E. W. S. Special credit is due to Mr. W. H. McCallum, not only for the enterprise he has exhibited in procuring the acetyl salt in the first instance, but also for his energy in perfecting the preparation.

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SOCIETY OF MEDICAL OFFICERS OF HEALTH: TUBERCLE GROUP.—The first annual meeting of the tuberculosis officer group, recently formed within the Society of Medical Officers of Health, was held on July 17th. Dr. F. N. Kay Menzies presided, and the business included the passing of the constitution of the group, the election of officers, and a discussion of the programme for the ensuing year. Dr. Benjamin Moore was elected president, with Dr. F. G. Caley as secretary and Dr. J. Sorley as librarian. A representative council of 25 members drawn from all parts of the country and from all branches of the work was formed. Dr. H. A. Ellis will be the chairman of this council. Meetings will be held monthly throughout the year, the presidential address being given to a meeting of the full society. Other meetings will be held at dates decided by the council to deal with discussions upon any topic of pressing interest and to receive reports from committees on special subjects. The central aim of the group is to draw together a strong body of tuberculosis workers of all kinds whose opinion when expressed may be a guide to the parent society and to the Government in the future development of the tuberculosis campaign.

SUDDEN DEATHS ON ACTIVE SERVICE.[1]

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SUDDEN death in one sense is, of course, one of the necessary accompaniments of war. I do not, however, propose to speak of the military side of the subject, though many of the cases of wounds, asphyxiation from gas, and death apparently from shock only, which it became my business to investigate, were of great interest and not a little importance. I intend rather to discuss some of the cases on which I made post-mortem examinations which come within the sphere of civil practice, and I have selected those cases in which, in England, an inquiry by a coroner would have been considered necessary. In many cases a "court of inquiry" was held, though I was by no means always summoned to attend, and in others no such inquiry was deemed necessary.

Nor, again, do I propose to include a number of accidents, some of which were incidental to the war, but most of which were caused by the usual sort of carelessness which causes so many of the accidents of civil practice.

In any campaign of large dimensions it would be strange if no cases of death occurred from other causes than wounds and sickness. The number of troops engaged on the front in France formed a considerable population and a very mixed one. The circumstances were, in many places, such as to cause hardships, heavy strain, at times privation, and almost always a greater or less degree of excitement and anxiety. Even though the men had passed a medical examination on enlistment, many escaped rejection who certainly were not fit to meet these conditions, and some whom any doctor would have judged to be fit did not stand them. Men often found themselves in conditions they would never have dreamt of, and when they were passed into categories lower than "A" it was not intended that they should be in those conditions, but circumstances were constantly arising which left them in the place of "A" men, and though the vast majority were little the worse some did not pull through on account of medical unfitness.

All the cases which I propose to discuss died at a base in France, though most had at some time previously been in the fighting line, and many would doubtless have returned there. Some, however, were "B" men, and were employed on base duties. All of them occurred between January, 1917, and January, 1919.

Sudden Death from Natural Causes.

As in civil practice, the most common accompaniment of sudden death from natural causes was found to be some disease of the cardio-vascular system, and of the heart and its vessels in particular. Out of 15 cases of this character, the cause of death was referable to vascular system in 12, 3 being cases of fatty myocardial degeneration, 6 of fibroid degeneration (more or less degeneration of the coronary arteries being present), 2 ruptured aneurysms, and 1 cerebral hæmorrhage. The remaining three non-vascular causes were: (1) a cerebral tumour; (2) diabetes mellitus; and (3) "gastrostaxis."

The following is an instance of death from coronary atheroma in a young subject.

The man, aged 30, was a gunner in an anti-aircraft section, and was on duty one night when there was a raid. No bombs fell within a considerable distance of him, and his gun was not fired, but he dropped down dead at the beginning of the raid. He had extensive atheroma of his coronary arteries, but none elsewhere, and a hypertrophied heart; nothing else abnormal was found in his body. Presumably the mere excitement of the moment was sufficient to cause death in a man with arteries such as his, given the mental temperament. From an ordinary examination of his heart few during life would have suspected coronary disease; he

[1] A paper read before the Medico-Legal Society on May 28th, 1920.

probably had no murmurs, and his heart would have passed for that of the strong and active man which his age and physique suggested.

The remaining cases of this type presented no features of particular interest. They were chiefly older men, and the common trio of granular kidneys, myocardial disease, and cerebral lesions was found, one or other of the three being the immediate cause of death. There were, however, two cases in which death was due to the rupture of an aneurysm of the aorta. The usual features of syphilitic disease of the aorta were found. Both aneurysms were situated in the descending part of the aorta—that is, where diagnosis is most difficult. One was a purely thoracic aneurysm, and burst into the left pleural cavity; the other involved the abdominal as well as the thoracic aorta, and made its way into the right pleura.

Of the last three cases, in which the cause of death was natural, undiagnosed diabetes accounted for one, and very likely I should have missed it too had my sense of smell for acetone been less acute. The man was hurried down from the front line during a rush after heavy fighting, which must serve as the explanation of the failure to diagnose.

The cerebral tumour case was not without interest, for death resulted in an unusual way. The man had had no previous symptoms whatever, and suddenly fell down dead on parade one morning. He was under no unusual physical strain, but the weather was hot. A tumour, about the size of a walnut, was situated in the position of the pineal body, and had led to great and rapid distension of the lateral ventricles. The tumour had apparently arisen from the choroid plexus, and on section proved to be a psammoma.

Gastrostaxis is not a common form of death, and perhaps the name is not well chosen, but as no other cause was found perhaps it will serve, as it did at the time.

The case was that of a young man who was found dead, having vomited a great deal of blood, and a quantity was found in the stomach and bowel. No source was found of this hæmorrhage after very careful search. The mucous membrane of the stomach was a little "eroded" and discoloured over all but that portion against which the bubble of gas had lain. It was considered on this account that the erosion was a post-mortem phenomenon, and of doubtful significance. Bleeding from the stomach or bowel was not uncommonly found in France as the cause of death in cases severely wounded and very septic. In such cases, however, one or more small ulcers were always found in the stomach, small or large bowel, or even in the œsophagus. No such condition was present in this man.

Cases in which Death was due to Suffocation.

I made post-mortem examinations on eight men who died as the result of suffocation. Of these three were found face down in sand, having inhaled a certain amount of it, two died under an overturned motor-car, and three had inhaled vomited material. Probably the first three were alcoholic, though it was proved in one only. None had bitten his tongue, or showed other sign of having had a fit, and two actually had tooth-plates in position in their upper jaws. In each case sand was found in the upper air-passages, in one down to the second division of the bronchi, showing that respiration had taken place after falling. No reason was found for a fall in an unconscious state, but the general appearance of the men suggested alcohol as the most likely. I do not now remember how many of these occurred on Saturday night, but generally Sunday was the day of greatest liberty. The two under the overturned car showed no external injuries, but the body of the car was lying across their chests in such a way as to prevent them breathing. They showed the usual signs of asphyxia, and one had hæmorrhages in the base of the tongue and in the substance of the tonsils.

Of three who inhaled vomited food, two were undoubtedly alcoholic. Their stomachs were found practically empty, but both the residual food and that inhaled smelt strongly of alcohol. In one of these cases food was found in the smallest recognisable bronchi; in the other larger fragments had prevented such complete inhalation. The third of these cases was a German prisoner of war, in whom alcohol could definitely be excluded. He was eating at the time of his death, and was believed to have had some kind of fit. All of these three cases showed œdema of the meninges, though whether this was the cause of the vomiting or the effect of suffocation is hard to say.

Deaths from Drowning.

In all, 18 bodies were brought for examination in whom death was due to drowning: 6 washed up after the sinking of torpedoed vessels, 1 fell into the river (recovered three days later), and 11 bathing accidents. All the bathing cases were seen within a few hours, but the others not for some days after death had occurred.

Apart from the immediate cause of death, there were cases—all bathing accidents—in which morbid conditions were found other than those attributable to death from drowning, and these may or may not have been contributing factors in particular instances. The coast was admittedly a dangerous one, but bathing accidents did not, as a rule, result from currents, and, for the most part, took place in comparatively shallow water. Among these secondary morbid conditions was one, which I found in three cases, and which interested me a good deal at the time, though I was unable to establish the theory I had formed with regard to it. Quite apart from the distension of the right chambers of the heart, there was great dilatation of the left side of the heart, and, in addition, pallor and friability of the muscle, without valvular disease. The three cases which showed this condition occurred within a short time of one another (at the end of July, 1918), and I believe they had all had influenza, and that the condition was attributable to that disease. In one of these cases I examined the heart muscle histologically, and found that fatty degeneration was present, though the subject was quite a young man. Of course, there are other diseases which might have produced the same result, but as influenza was prevalent at the time that seemed the most probable.

Other contributing factors in drowning cases were: old disease of the mitral valve, enlargement of the thymus gland, and in one case a small tumour at the side of the pons, a psammoma arising from the dura mater.

In cases of drowning external injuries are of importance. In the bathing cases such injuries were only trivial, occurred on the face, shoulders, and legs, and were the kind of injury that might result from dragging the dead man up the beach. Other wounds were produced prior to death, as, for instance, a severe gash on the lower jaw in a man from a torpedoed vessel. He had been several days in the water, as was evident from the condition of the skin, and the emptiness of the intestines suggested that he had not died for some time after taking to the water, but the wound was beginning to heal, and, in addition, his face was shaved to within half an inch of the wound, which clearly must have been done while still on board ship. Another had a recently healed skin wound of the head; nobody knew how he came to fall into the river, but this recent injury may have had something to do with it. A third, a member of the military police, had an old head injury, which had been trephined years before; he was drowned while trying to rescue another man.

I once had the unpleasant duty of identifying a nursing sister, who had been in the water three months after the sinking of a hospital ship. She was quite unrecognisable, and the body was largely converted to adipocere. She was identified by cutting off small portions of marking tape from various garments and putting them together. The time of her immersion was guessed from the fact that she had on her several £1 currency notes, which were of two different issues; as she was probably engaged in cross channel work she would be likely to get notes of the present issue soon after they were made current. Deductions based on these assumptions proved to be correct, and her identity was established.

As regards the morbid appearances of drowning, the classical froth on the lips, sand or weed in the trachea, and weed grasped in the hands, were met with only twice, in both instances in bathing accidents. Water

was found in the lungs in 14 out of 18 cases, and in the pleural cavities in 9. Subserous hæmorrhages occurred in 6, in the lungs in 3, in the lungs and liver in 1, and under the visceral pericardium in 2. Small hæmorrhages were found in the brain in one case.

A matter which interested me, as a novice in this kind of work, was the occurrence of water in the pleuræ of half of these cases of drowning. The water was generally equally distributed over the two pleuræ, and about a pint to a pint and a half in amount. It was not contaminated with blood or froth, and seemed in all respects similar to the water from which the body had been removed, but I had no means of making any analyses. The books to which I have had access refer only in a passing manner to this phenomenon, as if it were easy of explanation, or so uncommon as to need none. I searched the surfaces of the lungs carefully but could find no rupture. I distended a lung with water, but found no leak, nor did I expect to find one, for had the solution been so easy some blood should have been mixed with the water, and further, the equal distribution on the two sides suggested a general rather than a local cause. Water was found in the pleura only in bodies which had been in the water for a considerable time, and was not found in a few who were removed soon after death had occurred. This fact suggests that the phenomenon is a post-mortem one. It occurred to me that it might be explained in this way. At a certain time after death oxidation processes consume most of the air remaining in the lung alveoli; this leads to water being sucked down into depths of the lung which were air-containing previously, and perhaps the negative pressure in the pleura leads to the transudation of this water into the pleural cavity. I do not know if this is the correct explanation, but it seems possible, and especially if the body is lying in the water, face down.

Death from Suicide.

During the two years from January, 1917, to January, 1919, I examined the bodies of 11 cases of suicide, which exemplified three methods of committing the act: 4 by shooting, 2 by hanging, and 5 cut-throats. Of the 11, 1 was an officer and the others men. As far as I could ascertain, the underlying reason in most cases was worry, sometimes about domestic affairs at home, sometimes about loss of relatives at the front, and some undoubtedly were occasioned by an order to proceed to the firing line on the following day. I was not present at the inquiries held on any of these cases, because, I suppose, the cause of death was thought to be sufficiently obvious not to need medical evidence.

A. *Suicide by Shooting.*

The weapons used were naturally the service rifle and the service revolver, the latter being the officer's choice. The method of using the rifle was to put the muzzle into the mouth and press the trigger with the toe. The amount of damage that can be done in a fraction of a second by this means is perfectly extraordinary, and death can hardly be other than instantaneous, for as the weapon is of necessity directed somewhat backwards the bullet often passes through the pons or medulla. In one case the bullet followed almost the middle line, passing through the pons just to the left of the falx cerebri, wounding the longitudinal sinus, and leaving the skull just to the left of the sagittal suture. Such cases illustrate very well the great "explosive" effect of a rifle bullet discharged at short range, which is much more extensive than that caused by a revolver. Any skull in which the cranial cavity is penetrated by a rifle bullet, at such short range as this, is split like an egg into a large number of separate fragments by extensive fractures which intersect one another in different directions. Two of the three who chose the rifle had their skulls broken in this way. The third aimed badly, the bullet passing through the left ramus of the jaw, the jugular bulb, and out through the mastoid process, and not entering the skull at all. The left ear was completely disorganised, and the base of the skull extensively damaged by a number of radiating fractures.

Another point of interest in cases shot through the mouth is that although the weapon was introduced between the upper and lower jaws, yet the lower jaw is generally fractured as well as the upper. I imagine the mechanism of this phenomenon to be as follows. The explosive effect of the bullet, and the large volume of gas discharged, forces the fragments of the base of the skull apart in all directions, if only momentarily. The temporo-mandibular joint is a strong one and not likely to be dislocated by rupture of its ligaments; consequently the rami of the lower jaw are separated forcibly by the explosive effect. Fracture then takes place at the weakest point, through one or other canine fossa. Frequently, too, the lower lip is split in these cases, but the sudden discharge of gas into the mouth or the recoil of the weapon may be sufficient to account for that.

One officer in this series committed suicide by shooting, but he used his revolver, the entry wound, with typical powder blackening, being in the right temple. The bullet passed through the brain from side to side, destroying the pituitary body and sella turcica on its way. The ventricles of the brain were filled with blood, though I could not show that they were actually injured; I expect they were. The splitting of the skull as a whole was not so great in this case as in those preceding, injury being more restricted to the immediate track of the bullet. (Specimens were shown to illustrate the effects of rifle and revolver discharged at close range.)

B. *Suicide by Hanging.*

There were two instances of this, both being in men of middle age. In both death was due to asphyxia and not to injury of the spine or spinal cord. In neither case was I present at the court of inquiry, and I heard nothing of the circumstances under which the bodies were found, but if they were completely suspended they had not dropped far. The usual statement is that the mark of the cord is far more often found above the larynx than below it, and the cord is supposed to slip up when it takes the weight of the body. In one of my cases the mark was definitely below the level of the larynx, and in the other it was across the crico-thyroid membrane. It seems to me that at whatever level the cord is applied in the first place it is bound to rise later, and whether the final mark is above or below the larynx depends on whether or not the skin sticks to the cord, as would tend to be the case if the cord were tightly fixed. In any case the skin would return towards its original position if the body were soon cut down. A point which is contradictory to this view is that there was no mark of a knot in either case. One of these men had a considerable hydronephrosis, due to the presence of several stones in one kidney.

C. *Cut-throats.*

In this small series of suicides there were five cases of cut-throat, which makes this method the most common. In all cases the weapon was the razor. The general character of the wound produced was not abnormal, though the extent of injury was various. All were of greater depth and extent on the left side of the neck, and all but one extended to the right side. In that case there were two cuts, both high up and fusing into one at the lower extremity. One was a small and superficial cut, and divided little more than the skin; the second was deep, laid open the larynx, dividing on its way the left external carotid artery and external jugular vein, and the left sterno-mastoid muscle as well.

One of these cases in particular interested me.

A sergeant inflicted two cuts on the left side of his neck, which joined into one large gash just above his larynx, and extended to the right side. The spine was visible through the wound. He had divided the thyro-hyoid membrane, both internal jugular veins, and both superior thyroid arteries, but had left the carotid arteries intact. The œsophagus, prevertebral muscles, and the disc between the fourth and fifth cervical vertebræ were all injured. After doing this he put away his razor into its case, and that into its usual place in his kit-bag, causing later a certain amount of trouble owing to the disappearance of the weapon.

I will only refer to one more of these cases, that of an officer who cut his throat in hospital.

He had been admitted on account of neurasthenia, and was therefore a likely subject for such an action. Of course, his revolver had been taken from him on admission, as was the rule, which probably accounts for his having chosen this means rather than shooting. He cut himself from ear to ear, dividing both internal and both external carotid arteries, an unusually high and consistently high wound. Both vagus nerves were uninjured. In this man's case the reason for his action appeared to be the fear of losing his recently won promotion if he were sent home to England, as seemed likely in view of his mental state.

The few cases I have narrated, and the larger number to which I have only alluded, make a formidable collection to compress into a short paper, but I think the number is not out of proportion to the population from which they were drawn. At Etaples there was always a large number of men in the base depôts, as well as a considerable permanent local personnel. Probably at any one moment there were seldom fewer than 80,000 men, and often there must have been more. So far as the base depôts were concerned, this population was constantly being drawn upon, and as constantly replaced, so that the number of men who had been at Etaples during the two years 1917 and 1918 must have been very great, and it is from such figures that any opinion as to the frequency of the various causes of sudden death must be formed. Nor do I think that my experience differs much from that of other medical officers doing similar work, but I had the good fortune not to be moved about, and this enabled me to keep my records in order.

INTRINSIC CANCER OF THE LARYNX.

IMPAIRED MOBILITY OF THE AFFECTED CORD IN DIAGNOSIS AND PROGNOSIS. OBSERVATIONS BASED ON 44 CASES TREATED BY LARYNGO-FISSURE.[1]

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Historical.

INTERFERENCE with the movement of a vocal cord as a symptom in certain cases affected with cancer appears to have been first noted by Lublinski[2] and Semon[3] at about the same date. It was unfortunate that in one of his early communications Semon suggested that impaired mobility was a usual symptom and occurred at an early period of epithelioma of a vocal cord. In 1886 he wrote:—

"It is, in my experience, one of the most constant and valuable points of differential diagnosis between innocent and malignant tumours of the vocal cords, that the latter usually cause a considerable impairment of the mobility of the affected cord at a very early period—i.e., when only a small projection can be seen on the cord."[4]

Somehow the doctrine became circulated that impaired mobility was a usual symptom, and that if the cord moved freely or if the microscopic examination of a removed fragment (when this was feasible) was negative, a diagnosis of malignancy was not justified, and the case then had either to be treated as an innocent condition or left to develop. It has come my way to see no inconsiderable number of cases where this conception has led to disastrous results by losing the moment for successful operation. I regret to say that this mistaken and misleading opinion is still very widely held, although Semon himself, with more extended experience, saw the need of correcting the misconception. Twenty-one years later he formulated the following rule:—

"If the vocal cord from which a suspected laryngeal growth springs shows at an early period of the disease a defect of mobility other than due to mechanical impaction of the growth in the glottis on phonation, this sign is almost pathognomonic for the malignant character of the tumour. If, however, this sign should yet be absent when the case comes under observation, such negative evidence does by no means exclude possible malignancy."[5]

I quite agree with this rule. I would also recall that Semon only values this impaired mobility as a diagnostic aid in distinguishing between malignant and benign growths of the cords; it is of slight value in helping to differentiate epithelioma from tubercle or syphilis. When present, as Semon says, "it is a sign of great importance," and the observations here submitted will, I hope, help to establish the relative frequency and value of this symptom as an aid in both diagnosis and prognosis.

The present investigation leaves out of consideration cases which were only seen in consultation and cases which were not operated on. I thought that more valuable conclusions might be arrived at by limiting the investigation to cases which I had operated on by laryngo-fissure, in which the diagnosis in every case was confirmed by microscopic examination of the removed growth, and in which the after-history of each case has been followed up to the present date or until death.

Frequency of Impaired Movement.

I have had 44 such cases. In all of them the mobility was carefully examined and recorded on several occasions. Mere mechanical interference with the excursions of the affected cord, due to the projection of the growth, was noted when it was present, but is not recorded as an instance of impaired intrinsic mobility. Leaving such cases out of count, I find that of these 44 cases the affected cord was quite mobile in 27. In the remaining 17 cases its movements were more or less impaired, the degree varying from mere sluggishness to complete fixation. In three of these latter cases the defect in movement developed while the cases were under observation after periods of 10 days, 6 weeks, 6 months, or 9 months. In one case a feebleness in the tension and adduction of one vocal cord was noted two years before the patient returned with a subglottic malignant growth.

It was only possible to remove a satisfactory portion of growth before operation for microscopic examination in 10 out of these 44 cases. But it is noteworthy that in no less than 8 out of these 10 cases the cord moved freely. This shows that impaired mobility, when present, is a valuable diagnostic aid, as it is more apt to occur in cases where we cannot obtain a satisfactory piece of growth for examination. This is as we should expect—viz., that when a growth is embedded in a cord or tends to penetrate it the neoplasm is more likely to produce paresis than when it is projecting, or even (as in some cases) semi-pedunculated, for then a good portion (or even the entire tumour, as shown in one of my cases[6]) can be seized and removed through the mouth.

There was no mistake in diagnosis in any case. In one instance (No. 30) a very small, snow-white, papilloma-looking growth on the anterior third of a vocal cord was viewed with suspicion, as the cord was sluggish in action. The growth was removed absolutely level with the cord by the indirect method, and, after microscopic examination, reported to be a simple papilloma. Ten weeks later, as the anterior half of the cord was still less mobile and the surface of the cord had not healed over with a smooth, clean cicatrix, I proceeded to a laryngo-fissure. The growth in the cord, when exposed, was so small and uncertain in character that it was only after consulting the patient's son and family physician, and after their agreeing to removal of a growth of merely suspicious character, that I completed the excision of the cord. On examining this microscopically Dr. C. Fletcher reported that "the features are suspicious but the evidence insufficient to warrant a definite diagnosis of malignancy." The slides were then sent to Professor Shattock, who reported:—

"At the spot of thickening there is a distinct, somewhat wedge-shaped ingrowth. The superficial cells of the thickening are keratinizing. The epithelial cells of the ingrowth have lost their typical characters, and have, at the margin, wandered into the circumjacent connective tissue. My diagnosis is—a very early stage of carcinoma."

[1] A paper read before the Summer Congress of the Section of Laryngology, Royal Society of Medicine, London, June 24th, 1920.
[2] W. Lublinski: Berlin. klin. Woch., No. 8, Feb. 22nd, 1886, p. 122.
[3] Heath's Dictionary of Practical Surgery, vol. i., London, 1886, p. 895.
[4] Transacs. Clinical Society, London, vol. xx., 1886, Nov. 12th, p. 44.
[5] Transacs. Medical Society of London, vol. xxx., 1907, p. 113.
[6] StClair Thomson: Intrinsic Cancer of the Larynx; Complete Excision Apparently Effected by Endolaryngeal Operation. THE LANCET, May 30th, 1914.

This case is quoted to illustrate the anxieties in the diagnosis of some of these cases, the difficulties of the morbid histologist, and the value of impaired mobility, when present, in helping the diagnosis.

Valuable in Prognosis.

As to its value in prognosis:—Of the 27 cases with a mobile cord 21 are alive and free from local recurrence. Two have had local recurrence, 1 is dead from cancer in another part of the body, and 3 have died from other causes.

But of the 17 cases with impaired movement only 7 are alive and free from recurrence. Five have died of local recurrence; 1 died of recurrence in the glands; 1 from hæmorrhage following operation; and 3 have died from other causes. It is evident that when a case of intrinsic laryngeal cancer presents itself the prognosis is decidedly less satisfactory—so far as regards the ultimate result of a laryngo-fissure—if the cord is paretic or fixed. In such cases it would be well to consider carefully whether the usual laryngo-fissure is adequate, or whether some more extensive removal should not be initiated at once.

Conclusions.

1. Impaired mobility of a cord is not a necessary or frequent symptom of intrinsic cancer of the larynx.
2. It is, in fact, only met with in a minority of cases presenting themselves for diagnosis.
3. It is more apt to be met with in an early case when the growth is embedded in the cord or growing into it than in a distinctly sessile or even pedunculated tumour. It is also more usual with growths situated on the inner surface or the subglottic area, than with those seated on the upper surface of the cord. Otherwise, fixation indicates an advanced case.
4. When present it is a very valuable symptom in distinguishing a malignant from an innocent tumour. It is of little value, and may even be misleading, in diagnosing a malignant growth from a tuberculous or syphilitic deposit.
5. While in some cases it may be necessary to postpone a diagnosis in the absence of this symptom, yet, as it is desirable to avoid any delay, we may have to rely on inspection, the age, sex, history, and progress of the case, and the exclusion of other possibilities. The help of microscopic examination of a removed portion is only available in a small number of cases (10 out of 44).
6. As regards prognosis, it is an unfavourable symptom.[7]

THE PSYCHOLOGICAL ASPECT OF THE EFFORT SYNDROME.

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ON taking a general view of the war psychoneuroses we find that they reproduced all the symptoms ascribed to functional nervous disorders in civil life; very few symptoms were observed that had not been seen before, and conversely, what had been previously described could be illustrated. We find the usual bodily manifestations of hysteria: paralyses, contractures, incoördinate gaits, tremors, aphonia, mutism, blindness, deafness, fits, fugues, and somnambulisms; and on the purely mental side we find depression, irritability, anxiety, loss of volition, and psychasthenic symptoms such as phobias and obsessions.

The apparent absence of any well-known symptom group calls for explanation, and the following extracts from Osler's text-book on "The Principles and Practice of Medicine" (fourth edition, 1901) refer to conditions which are not found, prominently at any rate, in accounts of the war psychoneuroses. On p. 1118 we read, under the heading of hysteria:—

"Rapid action of the heart on the slightest emotion, with or without the subjective sensation of palpitation, is often a source of great distress. A slow pulse is less frequent. Pains about the heart may simulate angina, the so-called hysterical or pseudo-angina, which has already been considered. Flushes in various parts are among the most common symptoms. Sweating occasionally occurs."

On p. 1126 we read, concerning neurasthenia:—

"In other cases the *cardio-vascular* symptoms are the most distressing and may occur with only slight disturbance of the cerebro-spinal functions, though the conditions are nearly always combined. Palpitation of the heart, irregular and very rapid action (neurasthenic tachycardia), and pains and oppressive feelings in the cardiac region are the most common symptoms. The slightest excitement may be followed by increased action of the heart, sometimes associated with sensations of dizziness and anxiety, and the patients frequently have the idea that they suffer from serious disease of the organ. Attacks of pseudo-angina may occur.

Vaso-motor disturbances constitute a special feature of many cases. Flushes of heat, especially in the head, and transient hyperæmia of the skin may be very distressing symptoms. Profuse sweating may occur, either local or general and sometimes nocturnal.

Cardiac Patients with Psycho-neuroses.

If we look for symptoms corresponding to these descriptions we find them recorded, not among the psychoneuroses of war, but among those cases known as soldier's heart, the effort syndrome, or disordered action of the heart (D.A.H.).

Some quotations from the Report to the Medical Research Committee[1] on the subject will show this correspondence of symptoms.

P. 5.—"*Pain* is an inconstant but frequent symptom and one which, when present, varies in degree from precordial discomfort to pain of anginal distribution; it is especially associated with exercise....." "Giddiness is almost constant, and is associated with change of posture and with effort. Attacks of fainting are less common, and their associations are less clearly defined." "Palpitation ..... is very frequent, especially during and after effort." "*Coldness* of the hands and feet, *sweating* of the hands and feet, or excessive sweating of the body generally are very common."

P. 6.—It is the custom to find relatively rapid heart action in all circumstances, but the chief difference between the patients and healthy subjects in this respect is an exaggerated response of the heart-rate to emotion, exercise, and posture." "Intermittence of the heart, or an irregularity which clearly accompanies respiration when this is deepened by request, is not uncommon."

P. 25.—"In many of the patients flushing is easily provoked by relatively slight causes."

The similarity of the symptoms is insufficient to do more than suggest a resemblance between "nervous" and "D.A.H." cases. Osler obviously regarded the troubles he described as only a part of the more important nervous condition, and if we search the Report we find that nervous symptoms are in no wise lacking, for throughout it are scattered observations on the nervous aspect of the cases which only need a little emphasis to carry the resemblance to the point of identity. Some of these observations are:—

P. 5.—"*Exhaustion* is an almost constant symptom; it is usually provoked by sustained effort, but in a degree far in excess of that due to fatigue in healthy men. In severe cases it is a continuous symptom, and is not only physical but is equally mental." "*Headache*, which is almost constant, frontal or throbbing in type, often severe, and usually an after-symptom of exercise." "*Irritability* of temper, sleeplessness, inability to fix attention, shakiness, flushing, are common, especially the last three named." (P. 7.) "Many of the patients acquire the diagnosis of *neurasthenia* from time to time qualified by the phrase 'of the vaso-motor type'; especially is this so when brisk reflexes are associated with mental irritability or exhaustion."

(P. 59).—"Though emotional disturbances are more common than in healthy people, being exhibited in rare cases to a very abnormal degree, and though irritability of temper, lack of concentration, apathy, and depression are frequent symptoms, yet these disturbances are less pronounced than in patients who are commonly classed as neurasthenics."

It may be assumed that these observations were made without any deliberate psychological investigation. Nervous patients have a tendency, unrecognised by themselves, to stress their bodily symptoms and to remain silent about their painful thoughts and emotions; for this reason the deeper troubles associated with the effort syndrome may escape notice; the dyspnœa, faintings, palpitation, and heart pains become essential symptoms, and when accompanied by a rapid pulse form a picture which is regarded as complete. If the patient is asked about nervous symptoms he may, especially if he is of a temperament inclined to hysteria, deny anything except his heart trouble; but as a rule he will relate symptoms ranging from nervousness in traffic, ready starting at noises, depression, irritability, or insomnia, up to those of a deep-rooted psychasthenia, with phobias, obsessions, unreasonable feelings of

[7] Six patients were shown on whom laryngo-fissure had been performed at varying dates up to seven years ago. One case had presented himself with complete fixation of the infiltrated cord, but was free of recurrence three years after laryngo-fissure.

[1] Special Report Series, No. 8. H.M. Stationery Office. 1918.

incompetence or uncertainty, or even that sensation of the strangeness of the world which is described as a "loss of the function of the real."

At this stage of investigation it is easy to convince the patient that his symptoms are not due to heart disease but are only part of a nervous condition; the explanation is likely to be rejected if one tries to assure him that his heart is healthy without this preliminary inquiry into his mental state.

Psycho-neurotics with Associated Cardiac Symptoms.

Approaching the subject from the other end of the scale of symptoms, we find that men whose nervous state has been regarded as of primary importance—for instance, those diagnosed "shell shock"—show in a large proportion the rapid pulse of the effort syndrome, and if the disabilities allow of exertion the patients complain of the symptoms associated with that diagnosis; it is very common to obtain a history of previous admissions to hospital for some kind of heart trouble. (This view must be compared with that quoted above from p. 59 of the Report.)

Sensations are described in terms of heart or emotion, according to the way in which the man has been led to regard them. There are medical men who think of phobias as text-book curiosities and fail to recognise the significance of such complaints as faintness and palpitation, generally accompanied by shakiness, when the patient is in a train or a crowd, though if the man is questioned he will often describe a feeling of anxiety or fear, of which the cardiac symptoms are only the manifestations. The fainting attacks of the sufferers from the effort syndrome are really attacks of anxiety and primarily of emotional origin, being identical with the "nervous" attacks of the sufferer from an anxiety condition. There is no line to be drawn between those attacks and others, usually called hysterical, in which emotion finds expression in motor activity.

I cannot agree with the view given on p. 7 of the Report, where we read on the subject of terminology:—

"From the standpoint of military service it is a matter of indifference what term is employed providing that the method of dealing with the patients is not thereby influenced. But the diagnosis of neurasthenia has this defect, and the latter is not counterbalanced by an appreciable insight into the pathology of the condition."

It is essential that the man should recognise his condition; he is suffering from something, and until he realises what it is he will insist upon fixing his attention on the heart symptoms. It follows that I do not regard a diagnosis of D.A.H. as responsible for the symptoms in any large number of cases; if the man's attention had not been directed to his heart he would have found some other point of fixation for his troubles. I would illustrate this by reference to a recent inquest upon an ex-soldier who, discharged for valvular disease of the heart, had worried about his condition, and eventually committed suicide. Post-mortem examination showed a healthy heart, and the coroner, according to a newspaper report, said the poor man had been condemned to death by an ignorant army doctor. This judgment was not well founded; suicides of ex-soldiers suffering from depression are too common, and this man's nervous condition both produced the heart symptoms—probably the effort syndrome—and led to the suicide. A healthy young man does not commit suicide because he is told he has heart disease, and if this man had been diagnosed as suffering from neurasthenia or shell shock the end would probably have been the same, and no one would have been blamed for it.

I have met a few men without anxiety symptoms who had been told they had heart disease, perhaps on account of a functional murmur. Their attitude is usually quite reasonable, and although they logically attach value to the diagnosis it is possible to alter their belief by ordinary argument. In pensioners of a certain temperament, however, there are obvious reasons why a diagnosis of "heart trouble" aids a resistance against any view but that of organic disease, and if a man is tending towards an anxiety state it is plainly unwise to provide him with a diagnosis which will serve as a further source of anxiety.

Treatment must be directed towards the nervous condition and not to the heart symptoms. One method to this end was used in special heart hospitals when the "heart" condition was attacked by reassurance and persuasion combined with exercise; this method is a very old one as applied to the psychoneuroses.

The Psychological Processes.

A few words about the psychological processes concerned and the way in which they influence symptoms will aid in understanding the question of treatment. In war cases the processes are more easily revealed than in cases arising in civil life, and opinion is now crystallising round the view that the psychoneurotic symptoms depend upon a repression, or loss of memory, of incidents of a strongly emotional content. Though lost to consciousness these memories produce and maintain symptoms; they may produce stammers or tremors, hysterical fits, or paralyses and contractures. These bodily symptoms may also serve to gain an end otherwise unattainable by the patient—such as avoiding military service or some difficulty of adaptation—and the knowledge of this end may be the repression chiefly concerned; this "secondary function" is characteristic of the hysterical type of patient, in whom the emotional content of the repression may be so well fixed by the symptom that he shows no other signs so long as he is allowed to retain his bodily disability. This type passes gradually into that in which no secondary function is conceivable, and the disturbances are supported only by the emotional content of the repression, which shows itself in an anxiety state, accompanied or not by bodily symptoms.

In this latter group are men whose repressions find vent in phobias, anxiety attacks on slight or no provocation, fainting spells, or apparently causeless fear and apprehension. The patients are in a permanent emotional state.

The Connexion Explained.

So far I have presented conclusions supported by a considerable weight of experience and based upon psychological investigations carried out by many workers. Their application to explain the associated cardiac symptoms contains a speculative element. Certain signs, such as fine tremors of the hands and closed eyelids, together with a nystagmoid twitching of the eyes when lateral movements are tested, are associated with that muscular lassitude of which so many complain, and suggest a lack of tone dependent upon interference with the endocrine glands. Terror is accompanied by an increase of the adrenalin content of the blood; a continued state of emotion may, by affecting the ductless glands, produce the muscular signs above described, as well as the symptoms of the effort syndrome which accompany them. Whatever their cause, these symptoms differ from the purely hysterical ones in being unrelated to volitional control.

We can picture disturbance taking place at different levels of the nervous system; interference with the cortical centres gives us motor and sensory changes, generally called hysterical, as well as purely psychical ones. These we may call psychoneuroses, the more suitable word "psychosis" being already appropriated to indicate insanity. When the thalamic centres are involved—whether by over-stimulation or by loss of cortical control—excessive response is shown by ready starting at ordinary noises or by exaggerated reflexes, as when a tap upon the patellar tendon is followed by a general muscular reaction of the whole body. At a lower level the autonomic functions are disturbed; this is shown by increased sweating and other altered skin reactions, and by interferences with digestion. Here we may place the altered endocrine functions that affect muscular tone and maintain some of the symptoms and signs of the effort syndrome. The word "neurosis" may perhaps be properly applied to these changes at the lower levels of the nervous system, though they cannot be separated from the psychoneuroses as regards either cause or treatment.

If the psychoneuroses are accepted as due to repressions, then treatment should be directed to bringing the repressed memories into consciousness. It is beyond my present purpose to discuss how this can be done, but the effect upon the heart of treatment

directed towards the underlying condition is illustrated by a man who suffered from a severe anxiety state and had a pulse-rate of 160 (taken, it is true, during an examination by a pensions board) with the usual symptoms of the effort syndrome. He had a loss of memory for almost every emotional experience during two and a half years of fighting, and as the memories were revived with due emotional expression his pulse became less frequent and after nine interviews reached and remained at the rate of 76 per minute; his other symptoms showed a corresponding improvement.

On p. 23 of the Report is described a severe fainting fit in a young man who presented "the characteristic signs of toxic debility." The fit resembled closely those in a patient of mine whose frequent "heart attacks" were so alarming that he was placed upon the "dangerously ill" list; the attacks ceased after the revival of the one incident which they symbolised and which had been completely forgotten. Syncopal attacks in patients with repressed war experiences (and these patients include most of those who were subjected to the stress of actual warfare) can often be traced to definite repressions, as in the last example, and are benefited by their revival. Long-standing conditions, aggravated or not by army experience, present greater difficulties, and it is not practicable to treat by methods of mental exploration any large number of them. Even in these a recognition and explanation of the real condition is preferable to allowing the patient to go through life with a belief in the organic cause of his symptoms.

The question may be raised whether the symptoms in valvular cases are sometimes due to an anxiety condition; such a hypothesis would satisfy the problem raised in the Report in regard to the onset of symptoms after shell shock in patients with pre-existing valvular lesions. The existence of a symptomless and unsuspected organic lesion would not protect a man from a psychoneurosis, and the cardiac symptoms that arise would be attributed to the lesion, though they may be in no way related to it.

The possibility of other combinations must be considered. There may be a group of cases in which dyspnœa, cardiac pain, and palpitation persist indefinitely and depend upon physical causes, although no signs of heart or lung disease ever become manifest; there are certainly cases in which those symptoms are the first indications of organic disease; an anxiety state may exist in addition, just as it may in combination with other diseases. But the majority of cases found amongst pensioners and diagnosed D.A.H. are entirely of psychogenetic origin. If this fact could be generally recognised it would aid in the restoration to social usefulness of some of the men who now regard themselves as permanent invalids.

SYMBIOTIC GROWTH OF B. PROTEUS AND B. TUBERCULOSIS.

APPEARANCE OF AN ACNE-LIKE ORGANISM.

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(*With a Note by* R. A. O'BRIEN, M.D.)

SOME years ago I commenced a series of experiments bearing on the symbiotic growth of organisms in the mass of bacterial growth in the intestine. A five months' glycerine-veal broth culture of *B. tuberculosis* (bovine) was inoculated with a laboratory strain of *B. proteus vulgaris*. The proteus grew quite luxuriantly and no change in the morphological characters of the organisms could be observed on the seventh day. On the twelfth day a marked yeast-like odour was noticed on opening the incubator, and, on microscopical examination of the mixture, it was found to be crowded with a diphtheroid organism. Nothing further was done with this mixture as I presumed that the presence of this third organism was possibly the result of a contamination.

A repeat experiment was performed, using every precaution against contamination. Four strains of *B. tuberculosis hominis* and one strain of *B. tuberculosis* (bovine) were grown on large tubes of glycerine-brain agar for one month, after which time sufficient glycerine-veal broth was added to cover the growth, and inoculated with *B. proteus*. In all the mixtures the diphtheroid organism described in the first experiment was observed at the end of ten days. The yeast-like odour is apparently characteristic of this remarkable phenomenon, as it was noticed in all the tubes. Furthermore, the dense turbidity due to the growth of *B. proteus* had disappeared on the formation of this new organism. Subcultures made on surface agar showed no growth at the end of seven days, the proteus having died out. In stab glucose-agar, inoculated from the mixture, a growth was observed at the end of three days, which was strictly anaerobic. The growth was a compact one, starting about half way from the surface of the glucose-agar. On microscopic examination it was found to be the diphtheroid organism observed in the mixtures.

Morphologically and culturally this organism is identical with the acne bacillus.

With subsequent experiment it was found that the evolution of this organism was not constant, and up to the beginning of 1914 97 experiments with tubercle had been performed under varying conditions in order to determine the most suitable conditions under which the phenomenon occurred. 62 per cent. of the experiments were positive and the most favourable conditions seemed to be glycerine-veal brain agar cultures of tubercle to which 5 per cent. glycerine-peptone water to cover growth had been added. Temperature 37° C. The evolution of this organism has occurred in every strain of tubercle which has been subjected to this treatment at different times both in culture and in tissue—i.e., seven strains of human, six strains of bovine, one strain of avian, and one strain of piscian *B. tuberculosis* in culture. Three experiments were performed with tuberculous tissue; two were positive and one suspicious.

Experiments were carried out on organisms more or less allied to *B. tuberculosis* with positive results—i.e., *Streptothrix actinomyces*, *Str. birt* and *leishman*, the bacillus of Johne, and one of three strains of acid-fast bacilli isolated by Tobler.

A few animals (guinea-pigs and mice) were inoculated by Dr. O'Brien with living cultures of the new organism isolated from the tubercle + proteus mixtures, but the results were variable. The animals were killed and a diphtheroid was generally found in some of the organs. Exhaustive controls were carried out on all the organisms under experimentation in order to eliminate, as far as possible, any suspicious members of the group. The cultures were observed under aerobic and anaerobic conditions with and without the addition of glycerine-peptone water.

The work had not proceeded far when the proteus was started from a single organism by the capillary tube method. Many organisms remote from the tubercle group were grown in symbiosis with proteus, but in none of these, or other controls, did the evolution of this diphtheroid occur. The morphological characters of the organism varied from the almost coccoid diphtheroid to the long, club-shaped forms one sees in old broth cultures of *B. diphtheriæ*; this was especially noticeable with the organism isolated from the actinomyces + proteus mixture.

Repeated Experiments.

At this time several factors over which I had no control, and later the outbreak of war, prevented further work in connexion with the subject until quite recently, when I determined to repeat some of the experiments with the cultures to hand in my own laboratory. All the cultures in this later experiment were from other sources than those used at the Wellcome Physiological Research Laboratories. One strain each of *B. tuberculosis*, human and bovine, actinomyces bovine, a streptothrix isolated from a case at Westminster Hospital, and *B. smegmatis* were grown on glycerine-brain agar, the growth, covered with 5 per cent. glycerine-peptone water, and inoculated with *B. proteus*. In every tube the diphtheroid organism was observed in from 7 to 14 days.

The object of this paper is simply to place on record the work which has been done, together with the

results, without comment, as it would be premature to draw definite conclusions with such meagre data on a matter of such great complexity. However, in view of the last results there is justification in assuming that the appearance of this third organism is not due to a contamination, and that it strengthens the theories, so often hinted at throughout bacteriological literature, that the acid-fast organisms and the streptothrices are closely related, and that at certain phases of their existence no sharp line of demarcation exists.

My thanks are due to Dr. H. J. Südmersen, Dr. O'Brien, and Mr. A. T. Glenny, of the Wellcome Physiological Research Laboratories, and to Professor R. T. Hewlett for their help and practical interest in this work.

NOTE ON MIXED CULTURES.

BY R. A. O'BRIEN, M.D.,
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Several years before the war Mr. Thompson stated that while working as chief bacteriological assistant in these laboratories, he had inoculated cultures of *B. tuberculosis* with *B. proteus*, and that an acne-like organism had appeared in the tubes after the death of the *B. proteus*.

I was asked to investigate the matter, and made some mixed cultures. The phenomena described by Mr. Thompson occurred in one of the tubes of an early series. Several weeks after the mixed culture was made the *B. proteus* could no longer be recovered by subcultures, and there were present in large quantities strictly anaerobic bacilli which were Gram-positive, not acid-fast, and, morphologically, closely resembled the acne bacillus. I made several hundred experiments with different strains of *B. tuberculosis*, using cultures of *B. proteus* plated many times, and also a culture obtained from what appeared under the microscope to be a single *B. proteus*. In three of these experiments the second anaerobe made its appearance. Every ordinary bacteriological precaution to eliminate the possibility of contamination was used; the anaerobe could not be seen in smears made either from the separate cultures of *B. proteus* or *B. tuberculosis*, or from mixed cultures during the first week of incubation.

This anaerobe is practically unknown as a contamination in the multitude of cultures and sterility tests made in these laboratories in connexion with other work. Pure cultures of the anaerobes were injected into small animals; these remained healthy and were eventually killed. I was not satisfied that any pathological changes were present, though the bacillus was found aggregated in some of the glands and organs. Large doses of the organisms were injected into several guinea-pigs. It was not possible to demonstrate any alteration of resistance to infection by cultures of *B. tuberculosis*, which were subsequently injected.

The anaerobe never appeared in my cultures of *B. proteus* with various Gram-negative organisms, nor in those containing *B. tuberculosis* and Gram-negative organisms other than *B. proteus*.

Neither Mr. Thompson nor I could arrange the conditions of the cultures so as to ensure the appearance of this organism in every experiment. The results were very irregular, some series of many tubes failing entirely to give the results sought for. It was felt that it would be undesirable to publish these results unless one could describe the conditions with sufficient accuracy to enable the experiments to be checked by other workers. With the hope of being able, eventually, to control the conditions, the work was continued as opportunity offered, until the war stopped it. Mr. Thompson has now left these laboratories, and wished to publish the preceding note.

The change from the aerobic acid-fast organism to the anaerobic non-acid-fast Gram-positive one appears to be so opposed to the whole of general experience that one naturally inclines strongly to the assumption that the organism was a contamination. Yet the organism has never been found as a contamination in thousands of sterility and other tests made here in the course of many years, and it made its appearance despite every ordinary bacteriological precaution against contamination.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

LARYNGOLOGICAL CONGRESS.

THE second Summer Congress held by the Section of Laryngology took place on June 24th and 25th under the chairmanship of Mr. MARK HOVELL, and was in every way a success. A valuable aspect of the Congress was the full discussion of subjects intimately associated with the specialty—such as "Cancer of the Throat"—which the ordinary clinical meetings only incidentally raise in connexion with particular patients and specimens. Important addenda were a museum of pathological drawings and specimens (which was kept open for a week) and an exhibition of surgical instruments and drugs. There were a number of American and European visitors at the meetings.

Sir CHARTERS SYMONDS read a paper on Total Laryngectomy, in which he dealt in detail with the indications for operation, the special dangers, and how they could be met. He laid particular emphasis on the after-treatment, designed to ensure the greatest possible comfort to the patient and his participation, as fully as might be, in active pursuits. If the patient could breathe sufficiently well to carry him through the operation the speaker dispensed with preliminary tracheotomy. He showed two patients who were able to make themselves clearly heard years after the operation.

Sir ROBERT WOODS (Dublin) gave his experience in 25 cases, and described the after-treatment. Drainage of the pharynx afterwards he regarded as very important. He preferred total laryngectomy to attempts to get the growth away by median thyrotomy.

Sir WILLIAM MILLIGAN did not do tracheotomy beforehand unless it was urgently needed. He laid special stress on a thorough examination of the region with the œsophagoscope before deciding on the operation, as it was sometimes found in this way that the growth had a much greater extension downwards than had been suspected. The difficult part of the operation was the suturing of the mucous membrane of the pharynx.

Dr. F. LEMAÎTRE (Paris) favoured tracheotomy 14 days before the major operation in these cases. He used local anæsthesia.

Sir JAMES DUNDAS GRANT pointed out the type of cases in which simple thyrotomy sufficed for the removal of the malignant disease, and expressed the hope that this operation would retain its place for suitable cases.

Dr. J. J. KILLEEN (Chicago) said the results in the kind of cases under discussion which he had seen in America, where they were usually dealt with by the general surgeon, were very poor. There was now a growing tendency to refer them to the specialist, especially in New York.

Dr. IRWIN MOORE said that 30 years ago of 163 cases 41 per cent. died from the operation and 28 per cent. more were dead within a year.

Mr. WILFRED TROTTER discussed a measure of pharyngotomy for the exposure of large growths of the epilaryngeal region; it consisted of a minute examination of the various routes and their suitability in particular cases. The contribution was fully discussed, and Mr. Trotter further elaborated his methods in his reply.

Dr. LOGAN TURNER gave a series of illustrations of carcinoma of the post-cricoid region and upper end of the œsophagus, and submitted tables of sex incidence and age of onset. He also dealt with the symptoms according to the situation of the growth.

Mr. E. D. DAVIS read a paper on the Early Diagnosis of Carcinoma of the Oral and Laryngeal Pharynx, in which he drew attention to the value of a direct examination, either by suspension laryngoscopy or by means of the œsophagoscope.

Sir STCLAIR THOMSON followed with a contribution on the Significance of Impaired Mobility of the Cord in the Diagnosis and Prognosis of Intrinsic Laryngeal Cancer, which appears this week in our original columns.

Dr. A. BROWN KELLY read a paper on Œsophageal Obstruction due to Hypertrophy of the Cardiac Sphincter, with details of a case.

Sir WILLIAM MILLIGAN contributed a paper on the Removal of Foreign Bodies which became Impacted in the Food- and Air-passages, based on a large personal experience. He emphasised the importance of coöperation in these cases between the laryngologist and the radiologist, though a negative statement by the latter should not necessarily be accepted as conclusive.

Dr. P. WATSON-WILLIAMS entered into the question of Latent Sinusitis in Children, the symptoms of which were essentially similar to those of infected tonsils and adenoids, chiefly recurrent nasal catarrh, buccal respiration, catarrhal deafness, aprosexia, mental backwardness, and chronic sepsis. He described the methods of examination in arriving at a diagnosis and gave full details of an illustrative case.

Mr. H. LAWSON WHALE submitted a short thesis on Per-nasal Dacryocystostomy, showing the importance of attacking the sac itself, not the nasal duct. Acute empyema he regarded as a contra-indication of the operation. In his 25 cases, 63 per cent. were cured, and 12 per cent. partially so.

Dr. IRWIN MOORE's paper on Angeiomata of the Larynx consisted of a summary, in easily referable form, of all the recorded cases.

Mr. W. M. MOLLISON's concluding paper dealt with tonsillar infection as a source of various systemic and other diseases, such as endocarditis, myocarditis, rheumatoid arthritis, fibrositis, myositis, and "neuritis," also such skin affections as alopecia areata, lupus erythematosus, and psoriasis. In all the cases examined a streptococcus was found. About 80 per cent. of the cases treated by tonsillectomy were cured, and the remainder were left in statu quo.

On Friday afternoon a series of demonstrations were given, and in the evening the usual clinical meeting took place, when many patients were shown and their conditions discussed.

Reviews and Notices of Books.

SURGICAL SHOCK AND THE SHOCKLESS OPERATION THROUGH ANOCI-ASSOCIATION.

Second edition. By G. W. CRILE, Professor of Surgery, Western Reserve University, &c.; and W. E. LOWER, Associate Professor of Genito-Urinary Surgery, Western Reserve University. London and Philadelphia: W. B. Saunders Company. 1920. Pp. 272. 21s.

THIS book has been entirely revised, rewritten, and brought up to date in the light of war experience. The authors have aimed at presenting concisely the principles and practice of anoci-association methods, which they now designate by the term anociation; they do not discuss the various theories of shock, but merely state dogmatically their own position. The book contains a large amount of excellent advice on surgical technique, including many hints on the conduct of special operations derived from the authors' own abundant experience. The authors may justly speak with authority on the technique of avoiding post-operative shock by reduction of trauma, a method which will always be associated with the name of Crile. They advocate dissection by the knife rather than with blunt instruments, and emphasise the importance of avoiding psychical strain; treatment by blood transfusion is described in detail. Convincing statistics are given to show the superiority of nitrous oxide and oxygen anæsthesia over all others in serious cases, especially when combined with regional infiltration with novocaine.

The authors explain their results on Crile's kinetic theory of shock, attributing all the phenomena to exhaustion following attempts on the part of the organism to escape from nocuous influences; they assume an intracellular acidosis, but their theories are often strangely inconsistent. They consider nitrous oxide anæsthesia a partial substitute for sleep, and yet find that, in the worst cases of exophthalmic goitre, it is best to keep it so light that analgesia alone is caused without loss of consciousness. Assuming that nitrous oxide acts by interfering with the use of oxygen by the brain cells, they argue that the formation of acid substances in the brain is thus prevented; it is not clear why the opposite should not be the truer deduction. A crossed circulation experiment is reported in which the only proof of the occurrence of shock in either animal seems to have been the finding of certain histological differences in the nerve cells, these changes being themselves controversial. The result obtained would normally be expected from the experiment, even if these changes had nothing to do with the cause of shock. The photo-micrographs intended to demonstrate the cell-exhausting theory are not very convincing.

According to these authors "shock is a loose and unscientific term. We realise that it might well be dispensed with and the word exhaustion substituted." This is mostly true of shock as described in this book, but is by no means true of all shock. The term exhaustion might well be used for the post-operative reaction, which is largely of this origin, so as clearly to distinguish it from other conditions, such as the surgical shock of immediate onset after a severe injury, so often seen on the battlefield.

So well does Dr. Crile put his theories into practice that to anyone who has seen his wonderfully clean knife-work and bloodless surgery, and Miss Hodgins's excellent anæsthesia, the absence of post-operative reactions in his patients seems only natural. Whatever theory of shock may be held, this joint production is a valuable book, with which all surgeons should make themselves familiar.

DER KROPF DER WEISSEN RATTE.

Beitrag zur vergleichenden Kropf-forschung. Von Prof. Dr. Th. LANGHANS and Prof. Dr. C. WEGELIN. Berne: Paul Haupt. 1919. Pp. 131. Fr.14.

THIS small volume, published from the Pathological Institute of the University of Berne, and carrying on its title page the name of the late Professor Langhans as part author, is a report of experiments instituted in 1911–13 by the Swiss Goitre Commission. The experiments were designed more particularly to test Bircher's hypothesis that the endemic occurrence of goitre is associated with definite geological formations, and that goitre is due to some toxic substance derived from such geological formations introduced into the body in the drinking water. Bircher claimed that it was possible to produce goitre experimentally in white rats, monkeys, and dogs by supplying them with water from certain districts.

The present report consists chiefly of a detailed histological description of the thyroids of about 120 rats which had been kept in different localities in Switzerland on similar diets but different water. The results show that the drinking-water hypothesis cannot be accepted as an adequate explanation of the ætiology of endemic goitre, and that it is even doubtful whether it has any connexion therewith. In one district (Kazis), where goitre is endemic, the six rats receiving the local water all developed a typical goitre; but unfortunately for the hypothesis 10 of the 11 control rats which had received milk instead of water also developed goitre. Again, a series of rats kept by Kocher in Berne, and supplied with water from a certain district, showed marked goitrous changes in the thyroid; but another series kept in a different institute and receiving the same water showed hardly any changes at all. It is interesting to note that Bircher's hypothesis has also been tested recently in the Argentine, where goitre is endemic in certain regions. A recent volume of the "Revista del Istituto

Bacteriologico"[1] contains a paper by Wernicke, in which he dismisses Bircher's hypothesis as untenable. It would appear, therefore, that the drinking-water hypothesis must be relegated to the limbo of ingenious speculations which have had the misfortune of not fitting in with the facts.

The authors review critically the various hypotheses which have been put forward to explain the condition, and very cautiously—caution like goitre seems to be endemic in hilly countries—they refuse to accept any of them and suggest that more than one factor is concerned in the ætiology of endemic goitre, while commenting on the certainty with which potassium iodide in minimal quantities prevents it. One naturally reads with special interest their reference to McCarrison's work. They criticise his conclusions on the ground that feeding with fæces has in the hands of other workers failed to produce goitre. That criticism is not very convincing, since the bacterial flora in the intestine is a variable factor and is greatly influenced by the diet. They admit that the therapeutic results of intestinal antiseptics are a strong confirmation of McCarrison's views. In an appendix they deal with the contention of Chagas that the endemic goitre of Brazil is due to an infection with *Trypanosoma cruzi*. Rabbits and guinea-pigs infected with these trypanosomes showed no changes in their thyroid glands. The special form of goitre described by Chagas is probably an endemic goitre complicated by a superimposed trypanosome infection.

This careful and painstaking investigation is illustrated by numerous figures and supplied with a full reference to the literature of the experimental production of goitre. It seems a pity that no observations were made on the suprarenal glands of the goitrous animals. The testes, ovaries, pituitary and parathyroid glands are stated to show no abnormalities, but none of these organs are functionally as closely related to the thyroid as is the suprarenal gland.

THE SYSTEMATIC TREATMENT OF GONORRHŒA IN THE MALE.

Second edition. By NORMAN LUMB, O.B.E., M.B., B.S. London: H. K. Lewis and Co., Ltd. 1920. Pp. 123. 5*s*.

IN this second edition of a work published first in 1917 the author has included recent developments and improvements in diagnosis and treatment. The length of the work has not been increased, and its original object—that of providing a small volume for the use of students and practitioners—has not been lost sight of. The book aims especially at being a practical exposition of methods of treatment and diagnosis. It is clearly written, concise, and in many ways a serviceable work.

SYPHILIS DE L'UTÉRUS ET DE SES ANNEXES.

By Dr. E. OZENNE. Paris: Masson et Cie. 1920. Pp. 226. Fr.12.

Dr. Ozenne has undoubtedly furnished his readers with more information concerning syphilis of the female genitalia than has any previous writer on this subject. The book is packed with observations, and the subject is treated with a completeness that will appeal to the syphilologist rather than to the general practitioner of medicine.

The author believes that syphilitic lesions of the cervix, the uterus, and its appendages occur with greater frequency than is generally recognised. For this reason he devotes a great deal of his work to the question of differential diagnosis. Diagnosis is, indeed, the chief difficulty, for the syphilitic nature of these lesions is by no means obvious, and it is only by a very careful consideration of all the facts of the case that a correct conclusion can be reached. Where statistics of the frequency of occurrence of the various manifestations of syphilis are available the author has furnished them. Such statistics, however, do little but emphasise the great discrepancies existing in the observations of different authorities. For instance, the percentage of cases of primary chancre of the cervix is put by one authority at 0·53 per cent. of all cases of genital chancre, and by another (Newman) at 15 per cent. Moreover, after a careful consideration of the literature of the subject and of his own personal observations, the author has arrived at the opinion that the uterus and its appendages are much more liable to syphilitic infection than is usually supposed. Part I. of the work deals entirely with syphilis of the uterus. Part II. is devoted to syphilis of the tubes, the ovaries, and the mammary glands. The author, whilst admitting the value of the Wassermann reaction, rightly insists on the necessity of regarding this test as an adjunct rather than as the chief step in diagnosis. Great stress is laid on the value of clinical observation. The appearance of the various syphilitic lesions is accurately described and carefully contrasted with that presented by infections of a non-syphilitic nature. The omission of illustrations—doubtless for reasons of economy—is regrettable. A few plates would have been welcome, since long descriptions of pathological lesions are somewhat tedious. However, the work is a monument to the care and thoroughness with which the writer has studied his subject, and is the most complete existing work on this branch of syphilography.

SYPHILIS.

By K. K. CHATTERJI, F.R.C.S. Irel. London and Calcutta: Butterworth and Co. 1920. With numerous illustrations and coloured plates. Pp. 382. Rs.15.

THIS work by Mr. Chatterji, surgeon and dermatologist to the Campbell Hospital, Calcutta, is entirely an Indian production, being illustrated by an Indian artist and published by an Indian firm. The author has collected a large amount of information on the subject of syphilis, and evidently possesses a very extensive knowledge of European literature. The addition of his own observations in India provides a book of especial value as a record of syphilis modified by a tropical climate. The author is the originator of the margosate precipitation tests for syphilis. Sodium margosate is a derivative of margosa oil, prepared from the nim tree, and when added to an emulsion of washed red blood cells causes hæmolysis. The addition of normal serum to the mixture interferes with its hæmolytic action; moreover, the author has found that hæmolysis occurs with a greater dilution of margosate when syphilitic corpuscles are used than when the corpuscles are healthy, and a simple test is thus available. The author has also employed the margosates as therapeutic agents. The products of the nim tree have long been used in India in the treatment of skin diseases, notably syphilis and leprosy. The author has investigated the properties of margosa oil along scientific lines and has evolved a treatment based on a derivative of margosa oil from which he claims to have obtained satisfactory results. This treatment may be used in conjunction with salvarsan and mercury, and has already been discussed by Mr. Chatterji in the *Indian Journal of Medical Research*.

The pathology of syphilis is fully discussed in this volume, and the interpretation of the Wassermann reaction receives special notice. With regard to malaria, Mr. Chatterji concludes that if three weeks or more have elapsed since active manifestation of malarial infection a positive Wassermann may be regarded as evidence in favour of syphilis. Treatment occupies a very large portion of the book, and the author's conclusions are in harmony with those arrived at by the majority of European observers.

Altogether, Mr. Chatterji has produced a clearly written and well-arranged text-book on syphilis that may well become a standard work on the subject at Indian universities.

PSYCHOLOGIES.

By Sir RONALD ROSS. London: John Murray. 1920. Pp. 69. 2*s*. 6*d*. THE REVELS OF ORSERA. Same author and publisher. 1920. Pp. 393. 7*s*.

Sir Ronald Ross has an established reputation among modern poets, and this collection of five short dramatic

[1] Buenos Aires, vol. ii., No. 3, October, 1919.

pieces will further enhance it. In many respects these poems show a distinct advance on his "Philosophies." While there is the same wealth of imagery, a greater restraint in expression increases rather than diminishes their power. The quality of the verse is, as a rule, well maintained, but occasional weak lines occur, often with unfortunate effects.

In "The Revels of Orsera" Sir Ronald Ross shows versatility. This romance of the Middle Ages deals with the supernatural, and is based on ancient records. It contains some fine descriptive passages, and gives evidence of much historical research.

A TEXT-BOOK OF PHYSIOLOGY.

For Students and Practitioners of Medicine. By RUSSELL BURTON-OPITZ, S.M., M.D., Ph.D., Associate Professor of Physiology, Columbia University. London and Philadelphia: W. B. Saunders Company. 1920. Illustrated with 538 figures. Pp. 1185. 32*s*. 6*d*.

THIS work invades the fields of comparative physiology, physics, chemistry, and histology no farther than appears to the author absolutely necessary, for Dr. Burton-Opitz considers that the sole hope of modern medicine lies in physiology or, in a larger sense, the experimental sciences. "Since it may, therefore, be contended that 'medicine is physiology,' the student should make a conscientious effort to become thoroughly acquainted with this subject." We may say at once that the author has made a sustained and, on the whole, a successful attempt to enable the conscientious student of medicine to meet the high claim made for physiology. Diagrams and simple sketches form a feature of the book; some are original and others modifications of earlier sketches. A few of them might, we think, be improved, but the great majority of the diagrams are most helpful. It is unfortunate that such a large number of printer's errors should have crept into the spelling of authors' names.

There are one or two curious statements. "It was Cl. Bernard who first called attention to the fact that the occlusion of the duct of Wirsung produces a complete atrophy of the acini of the pancreas, but does not destroy the islets of Langerhans." (The activities of Bernard had ceased long before the discovery of the islets of Langerhans.) "Like saliva, gastric juice is secreted continuously, but only in amounts sufficient to lubricate the mucous surfaces." Amongst omissions —perhaps deliberate—are the subjects of progression in general, walking, running, and allied movements. We only point out a few shortcomings in order that greater control be exercised in the next edition. In one important respect—the introduction of certain historical data—this work is a marked improvement on most of the physiological text-books we have been called on to review recently.

The excellence and comprehensiveness of the text immeasurably outweigh its defects. The balance of the several subjects dealt with is well maintained and an adequate account of function is given in each section of a compendious, well-illustrated, and readable text-book.

ESSENTIALS OF HUMAN PHYSIOLOGY.

Fifth edition, revised and enlarged. By D. NOËL PATON, M.D., LL.D., F.R.S., Professor of Physiology, University of Glasgow. Edinburgh: W. Green and Son, Ltd. 1920. Pp. 679. 25*s*.

WRITTEN expressly for students of medicine and surgery by an experienced physiologist who has also had experience in teaching and practising these arts, this work has been enlarged, revised, and in part rearranged to secure a more logical sequence and greater prominence for those subjects which bear directly upon medical and surgical practice. This edition is in many respects a great improvement on its predecessors. The author need hardly apologise for allowing the names of investigators to appear frequently in his pages. On the contrary, there are a few classic names we would have gladly welcomed, notably that of Bichat in the section on tissues. The date of each discovery would have been useful, since Mariotte's experiment, Purkinje's figures, and Dr. Beaumont's fundamental observations on Alexis St. Martin form significant landmarks. Nor need the author be concerned about omitting the terminal *e* from the names of amido-acids and other similar compounds, when on one page appear side by side katalysers and catalysers, katalytic and catalytic actions. Again, while prominence is given on p. 76 to the methods of Marchi and Weigert, we failed to find the classic term "Wallerian degeneration," although it occurs in the index. Frauenhofer (p. 167) is obviously a misprint for Fraunhofer, as is Clark's vesicular column for Clarke's (p. 118). Perhaps in referring to the theories of colour-blindness the names of Young, Helmholtz, and Hering might have been introduced, more especially as Wrightson and Helmholtz are mentioned in connexion with the theories of the action of the cochlea. These, however, are small matters.

In the section on physiology of muscle we read with pleasure the explanation of the true relationship between oxidation and muscular contraction. Contraction is not due to oxidation, but to the throwing out of sarcolactic acid—that is, to an increase of H ions, which produce changes in surface-tension with the development of "tension." Muscle in contracting thus acts not as a heat engine which liberates energy by combustion, but as a compression engine which liberates energy already stored. The subject of food is admirably expounded, especially the arguments in favour of a liberal protein intake (p. 307). On the thorny question of accessory food factors, notably fat-soluble A, Professor Paton refers to the absence of this factor "as causing not only an arrest of growth, but also a peculiar inflammation round the eyes"—presumably xerophthalmia. Of rickets he says, "the cause of the disease is still unknown." The chapters on the circulation have undergone very material improvement. A figure of the heart-lung preparation of Starling is introduced and the great physiological value of this method is expounded. The recent work on the volume, pressure, and transfusion of blood is dealt with in detail, and its bearing on the theory and treatment of shock.

We notice many additions and improvements in the treatment of the subject of respiration, and also of the complex problems that surround the secretion of urine. The information on chemical regulation of growth and function is particularly good, more especially with reference to structures with internal secretions called by the author "endocrinetes." He regards the name of hormones as unsuitable and prefers "thyreoid" to "thyroid," "neurolemma" to "neurilemma."

We feel sure that this lucid survey of the essentials of physiology and their practical application to medicine will prove an attractive and instructive exposition to the thoughtful student of medicine.

DODI VE-NECHDI (UNCLE AND NEPHEW).

By BERACHYA HANAKDAN. Edited from MSS. at Munich and Oxford, with an English translation, introduction, &c., to which is added the first English translation from the Latin of Adelard of Bath's Quaestiones Naturales. By HERMANN GOLLANCZ, M.A., D.Litt. Oxford: Humphrey Milford. 1920. Pp. 161–160. 21*s*.

ONE of the characteristics of the Middle Ages was a passion for knowledge as exemplified in the rise of universities, in the wanderings of scholars not only over Europe but to the East, and in the labours of translators, the school of Gondisapor, and the literary output of men such as Michael Scott and Gerard of Cremona. English readers owe a debt of gratitude to Dr. Gollancz for having made accessible to them the two works now before us, the one a treatise by a learned French rabbi, by name Berachya, and the other a work now for the first time translated into English from the Latin, by Adelard of Bath, of which Berachya's treatise is a paraphrase or adaptation. Both are cast in the form of a dialogue between an uncle and a nephew, and are of great interest as showing the views of our mediæval forefathers on various questions in natural philosophy,

although the answers do not always elucidate the questions. For instance, Berachya's nephew asked why he could hear but not see through a wall. He was told "that sound, which is air, passes through pores which are not visible," but "the eye has power to see the wall as the light of the sun shines upon it, but it cannot see through the wall."

One question interpolated between Q. XX. and Q. XXI. of the Munich MS., which corresponds to Q. XVI. of Adelard, throws an interesting light on the process of early dissections. Adelard says: "When philosophers thought it of importance to investigate the systems of sinews and veins ..... they fastened, no doubt, a human corpse in a river, and kept it exposed to the current until all the skin and flesh had fallen off, while the sinews and veins, which are of stouter material, were left behind. Such was the way in which the contexture was made clear to them."

Another problem discussed is, "Why the sea is salt." Berachya and Adelard both give the not very convincing reason that the sea, being much exposed to the sun's rays, becomes salt by reason of the heat. As a proof, those who live near the sea will tell you that salt is found as the residue of the water on rocks which are exposed to the sun. The saltness of the sea was a great puzzle to our forefathers, and in Felix Fabri's delightful "Evagatorium" a long dissertation on the matter will be found.[1] He gives various opinions, but adds that the ancient philosophers erred. He quotes with approval a passage from the "Speculum Naturale," wherein the author explains that the sea water is salt because the water contracts divers qualities from the earth.

There is an interesting point of physical geography discussed in Q. VII. of the Munich MS., in 33 of the Bodleian and C. LIII. of Adelard—namely, why the inflow of the rivers does not increase the size of the ocean—and in all three places the answer is that the water gets back from the sea to the land by subterranean ways, and gets purged of its salt on the way. Adelard probably took this answer from Seneca, Quaest. Nat., but the same theory is found in Lucretius, V., 261, and VI., 608 et seq. Mr. Warde Fowler has used these passages in his usual charming manner to write a most illuminating note on Aeneid, VII., 31 to 80, concerning Virgil's idea of a great underground water system (see his "Aeneas at the Site of Rome," p. 37).

It appears from Dr. Gollancz's learned introduction to his translation of Berachya's other work, "The Ethical Treatises," that Berachya was a French Rabbi who flourished about A.D. 1160, but scholars are by no means agreed either as to the date of Berachya or as to his identity. Neubauer, for instance, says that "we must accept the existence of two Berachyas, or possibly of three." The questions both in "Uncle and Nephew" and in Adelard's treatise are not generally concerned with medical matters, but there is one question in Berachya[2] which puts forward the problem, "Why does a healthy man become infected when he lies with a woman with whom a diseased person had been lying, whilst the woman herself with whom this diseased one had been lying is immune from infection?" Adelard in his version limits the infection to leprosy, but it is possible that Berachya's version may refer to venereal disease properly so-called, and so be some evidence for the existence of syphilis in Europe anterior to the generally accepted date.

HANDBOOK OF DISEASES OF THE RECTUM.

Third edition. By LOUIS J. HIRSCHMAN, M.D., F.A.C.S., Professor of Proctology, Detroit College of Medicine. London: Henry Kimpton. 1920. Pp. 378. 30*s*.

THE author states, in the preface to the first edition, that his aim has been to produce a working handbook for the assistance of the general practitioner in the diagnosis and treatment of ano-rectal diseases. "Only those conditions which are amenable to treatment in office practice have been discussed." The author is an enthusiast in the field of local anæsthesia, and the operative treatment of hæmorrhoids and fistula without general anæsthesia is fully described. The subject of carcinoma of the rectum does not come within the scope of this work, but the importance of early examination in all cases of hæmorrhage from the rectum is emphasised. In the present edition the text has been revised and more illustrations have been added.

Clear accounts are given of all methods of investigation used in cases of rectal disease, and special emphasis is laid on practical details which may save the patient from discomfort and from the necessity of prolonged confinement to bed. There is a good chapter dealing with the technique of local anæsthesia; the author finds ½ per cent. solution of quinine and urea hydrochloride most generally useful. The chapter on "Constipation and Obstipation" seems rather out of place in a book of this sort and is necessarily incomplete. Most of the illustrations are good, though some seem unnecessary, as, for instance, the figure showing how to apply a lubricant to the finger.

Judged by the standard laid down by the author in his preface the book is a success.

CRISES.

By MAURICE LEVEL. Translated by ALYS EYRE MACKLIN. London: Erskine Macdonald. 1920. Pp. 239. 6*s*.

THESE tales of mystery and horror are translated from the French of Maurice Level, and in their original form attracted considerable attention in a well-known French newspaper. Those who read them in that form may recall the particular feeling of suspense, of pity, or of nausea which they evoked, but in their English shape it is not very probable that they will have the same appeal. The intent to thrill, soften, or sicken the reader remains obvious, but in our opinion it will generally miscarry. The little stories would have had more chance if they had reached the reader without an introduction and a prefatory note by the translator, in each of which too much is protested. Granted that M. Level employs the methods of O. Henry, this does not substantiate any right to a comparison with Edgar Allen Poe. In the French form the terseness of the work may give it an artistic claim which it lacks in the translation, but in their English garb the stories lack the sense of mystery and horror which the translator's subtitle attributes to them, and it is just that sense which makes Poe absorbing, even when he is most preposterous. Perhaps M. Level's stories "bear a closer relation to life" than Poe's, but that is quite another point; they are certainly not "more concentrated in their horror." They are, as a matter of fact, machine-made stories of the fat-boy order, and suffer, as collections of stories written on the same recipe must always suffer, from the monotonous effect produced. The first story is the best in the book.

DISEASES OF THE CHEST AND THE PRINCIPLES OF PHYSICAL DIAGNOSIS.

Second edition, revised. By GEORGE WILLIAM NORRIS, A.B., M.D., and HENRY R. M. LANDIS, A.B., M.D., Assistant Professors of Medicine in the University of Pennsylvania. With a chapter on the Electrocardiograph in Heart Disease, by EDWARD B. KRUMBHAAR, Ph.D., M.D., Assistant Professor of Research Medicine in the University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. 1920. Pp. 844. 35*s*.

IT is less than two years since the publication of the first edition of Professor Norris and Professor Landis's book. Certain articles in the present issue have been recast, and there have been added descriptions of several conditions previously omitted. These include such subjects as influenza, streptococcal empyema, spirochætal bronchitis, calcification of the lungs, chronic inflammatory conditions of the lungs of uncertain ætiology, and pneumopericardium. The book does not concern itself with treatment; its chief aim is to serve as a guide to the physical diagnosis of diseases of the heart and

[1] Vol. i., Ed. Hasler, 1843.
[2] Munich Cod. xlii., Bodleian MS. 26, Adelard xlii.

lungs. The authors rightly insist that it is only through a comprehension of the laws governing the production and transmission of sound that the results of percussion and auscultation can be intelligently interpreted, and they devote the first 260 pages to the examination of the lungs and circulatory system, the subject of diagnostic acoustics being treated at greater length than is usual in books of this character. In the main this section of the work is in accordance with scientific principles and leaves little to be desired. Another feature calling for comment is the lavish provision of photographs of frozen sections from the cadaver previously hardened in formalin, so that the anatomical relations of the organs are preserved as in life.

In the later portions of the book dealing with morbid conditions of the heart and lungs no less than 15 clinical varieties of pneumonia receive notice, and this is a fair example of the very thorough manner in which the authors have carried out their task. They appear to take the view that influenza is primarily attributable to Pfeiffer's bacillus, but that in a very large number of cases the bacillus opens the door to other organisms, such as streptococci, pneumococci, staphylococci, and Friedländer's bacilli, and that these secondary infections are largely responsible, not merely for various complications which may arise in the course of a case, but even for the protean forms which this particular fever may assume. The book is beautifully and profusely illustrated, and the new edition is certain of a favourable reception.

WAR AGAINST TROPICAL DISEASE.

By ANDREW BALFOUR, C.B., C.M.G., M.D., &c. London: Baillière, Tindall, and Cox. 1920. Pp. 220. 12*s*. 6*d*.

UNDER this title are collected in one volume a number of lectures, or sermons as the author prefers to call them, delivered on various occasions on the common text of the supreme importance of hygiene in waging war against tropical disease, and published under the auspices of the Wellcome Bureau of Scientific Research.

In addressing different audiences Dr. Balfour treats his subject from many points of view, but always with an erudition and felicity of expression which do the fullest justice to the intrinsic interest of his theme. Interwoven with the subject-matter is a wealth of anecdote and apt quotation, and the result is a volume of absorbing interest, which the reader is not likely to lay aside till he has perused it to the last word. In the lecture on preventive inoculation against typhoid and cholera, originally delivered at a meeting of the Research Defence Society, nothing is lost through the presentation of the subject in non-technical language, and the essential facts of immunity are indicated in a manner which is intelligible to those who do not possess a strictly scientific training. Included in the series are the Chadwick lectures for 1919, in which the author deals with the problem of hygiene in Egypt, and comments on the important findings of the Commission, of which he was the chairman, appointed to inquire into the organisation and work of the public health department of Egypt. These lectures were published in full in THE LANCET last September. The only serious defect in a book teeming with information of a practical kind is the absence of an index; this is not compensated for by the very full table of contents.

JOURNALS.

Tubercle. A Monthly Journal Devoted to All Aspects of Tuberculosis. Vol. I., No. 10. July, 1920.—Dr. W. C. Rivers. leads off with a short study of four clinical phenomena of tuberculosis—viz., trauma, muscular signs, vicissitude, and recidivism—treating them with clinical insight though he is mistaken in saying that "until lately practically no consumptive recovered, so that practically none could relapse." There are many historic cases of recovered tubercle: Goethe and Ruskin were doubtless such, and recidivism is perhaps as old as the disease. Dr. Rivers points out the high diagnostic value of trapezius atrophy and shoulder drop in pulmonary tubercle, and concludes by suggesting that the four phenomena above referred to indicate a high degree of natural immunity, and would thus probably be rare in lunatics and in negroes and Polynesians.

New Inventions.

A SIMPLE FORM OF RHYTHMIC INTERRUPTER.

IN treatment of paralysis following poliomyelitis, &c., by means of arm and leg baths it has frequently been shown that a rhythmic interruption of the current produces the best results. This is usually obtained by a motor-driven contrivance, which is bulky and expensive. The apparatus described below can be made for a few pence, and I have found it perfectly automatic and reliable. In construction it is somewhat similar to that described by Dr. Norman Aldridge in THE LANCET of Jan. 8th, 1910. The syphon arrangement of the present form was found to work more evenly.

The apparatus consists of A, a glass tube 6 in. long, ⅝ in. bore, open at both ends, and connected by means of rubber cork B with glass tube C, which is bent in the shape shown and has ¼ in. bore. At the end of C is fitted a rubber tube D, of convenient length to discharge into sink or pail. Two electrodes, E E′, are then cut from sheet copper 3 in. long, ½ in.

FIG. 1.

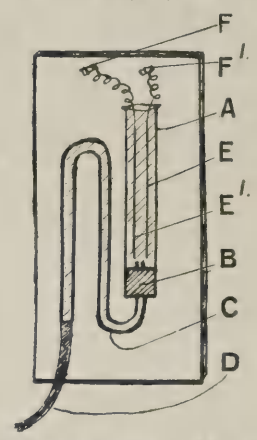
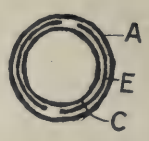


FIG. 2.

FIG. 3.



wide at top, and shaped as shown in Fig. 2. Wires F F′ are soldered to these and the electrodes are moulded to fit the tube A, and kept in position by a short length of rubber tubing, C, fixed between them (Fig. 3). The whole apparatus is mounted on a board. The leads F F′ are put in the circuit of the current to the baths, whether this be continuous, sinusoidal, or faradic. The apparatus is then suspended from a water tap and the flow of water adjusted. It will be found that the water will rise in the tube A until it reaches the level of the top of tube C, and will then syphon automatically. As it rises more and more current will flow between the electrodes until a maximum is reached and then it will wane to zero again.

A suitable periodicity is about 15 per minute, and this rate is obtained in the apparatus described. The rate depends on the ratio of the bore of tubes A and C, and bearing this in mind a quicker or slower periodicity can easily be obtained. Debedat, experimenting on rabbits, used a periodicity of 30 per minute and showed a 40 per cent. gain in weight with faradic current and an 18 per cent. gain with galvanic current. He stimulated the hamstring muscles of one side four minutes daily for 20 days and obtained these results by comparing with the opposite side.[1] H. Bordier made similar experiments on muscles of a healthy human being and obtained similar results.[2]

It is important to prevent stretching of the paralysed muscles by the opposing set, and to obviate this light splints can be arranged during the bath treatment.

Sutton, Surrey. J. NEIL LEITCH, M.B.

[1] Archives d'Électricité Médicale, February and March, 1894.
[2] Ibid., 1902, p. 331.

THE APPOINTMENT OF WOMEN MAGISTRATES.—Early in the week a list was issued by the Lord Chancellor containing the names of the women to sit on the judicial bench in England, Wales, and Scotland. The names were submitted to him by the Women's Central Advisory Committee appointed for the purpose. Amongst the names, which are not intended to be complete, appear those of Dr. Ethel Bentham, Dr. Janet Lane-Claypon (dean of the Department of Household and Social Science in King's College for Women), and Dr. Mary Scharlieb.

THE LANCET.

LONDON: SATURDAY, JULY 24, 1920.

The Organisation of Medical Service.

THE Health Services Vote, that is, the vote for the salaries and expenses of the Ministry of Health, including the grants and expenses with regard to Housing, the grants to Local Authorities, and those to meet the demands under the National Insurance Health Acts, was taken in Committee in the House of Commons at the end of last week In our Parliamentary report there will be found a résumé of the important speech in which Dr. ADDISON told the House and the country something of the size of the problems which his Department in the first year of its existence had had to deal with, and something of the way in which the responsibilities had been met. The things to be done and the ways to do them were alike so multifarious that it would have been as useless as impossible for the Minister of Health to do more than give outlines, but every word that was said by Dr. ADDISON revealed that necessity for the organisation of the health services of this country which was the origin of the Ministry of Health, while his description of the courses taken to meet the various difficulties and the commencements made to deal with them showed insight and foresight. During the first year of its existence the amalgamation of the work of the Health Insurance Department with the Registrar-General's Department and with the work of the Board of Education, both in regard to School Medical Service and the care of prospective mothers, has proceeded steadily; the duties of the Home Office under the Children Act are being brought into line with the activities to which they have a natural affinity; while definite steps are being taken to deal with the position of lunacy, the incipient stages of which have hitherto been neglected by preventive medicine.

Such is Dr. ADDISON'S message to the country, but in the meantime developments have taken place indicating with some particularity the part to be played by the practitioner of medicine in this huge programme. In announcing last week the appointment by the Ministry of Health of a service of outdoor medical officers for whole-time duty we suggested that those officers, who represent a distinct advance in the organisation of panel service, would also play their part in the general organisation of the medical service of the country in its initial stages. How this will come about exactly in any given place depends upon local circumstances to a great extent, and it is previous to dwell upon this side of the matter while many of the detailed activities promised under the appointment of outdoor medical officers have still to be put in going order. At the present moment the great necessity for medical men is to take an all-round view of what is being done by the Ministry of Health for the national organisation of medical service. How is the general plan of the Ministry evolving is the question now, and the subsequent questions will be—How does any particular action or promise of the Ministry fit in with that plan? A profession like that of medicine is not expected by anyone to follow blindly an arbitrary leadership—the whole spirit of Dr. ADDISON'S administration shows that he expects nothing of the sort; but the task before his department and before the medical profession, upon whose shoulders the future work will mainly lie, is so far reaching, and so intimately bound up with the social life of the people with its multifarious interests, that it cannot be easy for any of us to keep the central ideas prominent. The Interim Report of the Consultative Council of Medical and Allied Services for England—it will be more convenient if for the future this document is alluded to as the Dawson Report—has now been under the consideration of all sections of the medical profession, of the British Medical Association, and of the public for some weeks, while here and there points in it have been the subject of Parliamentary comment. The ideal nature of many of the proposals is confessed, and the expense of the institution of any such scheme in entirety would be colossal, so that no one, least of all the Council itself, expects legislative realisation of the recommendations *en bloc* and at once. But all the public notice which the Report has received confirms one impression. It is this. That it is considered, alike by the medical profession individually and through the British Medical Association, that the erection of Primary Health Centres is not only a pivotal part of the projected scheme, but a necessary development of the modern reading of preventive medicine in the larger sense—not the preventive medicine called hygiene, but that preventive medicine which forms the therapeutics of the future and which aims at arresting disease at its inception. Of the way in which the Primary Health Centre may work, practical illustration has been given both in the Dawson Report and in the recent discussion thereon at Bristol, when Dr. MIDDLETON MARTIN, the medical officer of health of Gloucestershire, described what had been proposed in his own county. We may take it for granted that something analogous to the organisation which he explained, and whose features may have been familiar to some of his audience, is beginning to work in Gloucestershire and will be applied elsewhere, assuming that the necessary expenses can be met. For purposes of clearness the statement must be repeated that Primary Health Centres cannot all be of the same pattern and probably will not be able to discharge the same public and professional duties. But they should all have this in common—whether they be newly constituted centres, or developments of existing cottage hospitals, or intimately allied with secondary or superior health centres as developments of the out-patient departments of voluntary hospitals—they will all be centres at which the professional and scientific activities of the general practitioners of the neighbourhood can be concentrated and from which they can be diffused.

The first stage, then, in the organisation of medical service under the Ministry of Health promises to

be the establishment of Primary Health Centres, with due regard to local circumstances; and we see at once that, as these centres are to be based upon Secondary Health Centres, in other words upon the great voluntary hospitals, the voluntary principle will be supported in the main, however much local circumstances may here also play a part in dictating the measure of State or municipal assistance required. But the general practitioners who will staff and conduct the Primary Health Centres will in a great proportion of cases be associated with panel practice, the practice in which the new outdoor medical officers will play an important part in the future. Thus a medical service coördinated in all its forms should arise, the general practitioners of the country being the foundation upon which the fabric stands. Their energies, private or public, and whether grouped at their centres or diffused in part-time appointments of a public nature, will be brought into touch alike with all that the great voluntary hospital stands for in knowledge, research, and training, and with the official administration of the Ministry of Health.

Plastic Surgery of the Face.

SUCCESSFUL demonstrations at the Cambridge meeting of the British Medical Association no doubt brought home to a wide circle the progress made during the last few years in the plastic surgery of the face. The awful disfigurements produced by war wounds of the face must have seemed to some of the sufferers worse than death itself, and the appeal of their mental sufferings to the surgeons confronted with the task of alleviating their condition was assuredly very great indeed. These demonstrations were given by Mr. P. P. COLE and Mr. H. D. GILLIES, whose names have for some time been associated with the advances that have been made in the plastic surgery of the face, and now the latter has made public in a large and fully illustrated volume[1] the results which he has obtained following on the intensive work at the Queen's Hospital, Sidcup. This hospital was staffed by officers picked with great insight from institutions whose loss became Sidcup's gain. Our columns have included at various times the work of Mr. KELSEY FRY, Mr. J. L. AYMARD, Mr. G. SECCOMBE HETT, Mr. H. P. PICKERILL, Mr. GILBERT CHUBB, and others. Hence, while special departments at other hospitals were earlier in the field, notably that of the Eastern Command at Croydon under Sir FRANK COLYER'S direction, Sidcup has naturally obtained the larger measure of public recognition. No doubt all the medical staff at Sidcup felt very strongly the emotional appeal to which we have alluded, and the wards, we know, afforded extraordinary opportunities for observations on the psychology of the wounded man; but it is clear that they have also been stimulated by the pride of the craftsman, and it is, naturally, this side of their work which is described in the volume before us. Mr. GILLIES modestly points out that nearly all the methods employed have been in use for many years, some of them for six centuries or more, but ancient lineage does not detract from modern prowess. It is quite evident that for the developments of technique initiated at Sidcup inventive courage and an almost superhuman patience were needed, and even these qualities would not have led to success unless coupled with an unusual dexterity and ingenious and creative minds. Many of Mr. GILLIES'S operations were so boldly conceived that it might well have been forgiven him had he compromised with the misgivings he must occasionally have felt in carrying them out. But scientific conviction did not fail; rather it found support in hope and imagination, which carried the various operators over periods of failure and depression and allowed them to call upon their patients for trust.

In the final result it is not only those suffering from the immediate effects of the war that have benefited, but also those who have endured the ravages of disfiguring disease or accidents. The work first devised and done at Sidcup has passed into civilian practice, and some strikingly successful cases of plastic operations for conditions such as lupus and epithelioma of the face were shown at the Cambridge meeting. It is now possible to enunciate certain principles which must affect the course of surgery in the future. Never before has "cosmetic" work been done in such bulk or subjected to such searching criticism, but now it can be claimed that the science of plastic surgery is being built up on solid foundations, with much of the evidence fully recorded. The first great principle that is laid down is the paramount importance of restoring function; good cosmetic results will follow if this principle be never forgotten. The fashioning of a new nose failed until function came to be the prime object; the elaborate operation finally devised has in many cases been entirely successful both functionally and cosmetically. The same principle stimulated the elaboration and ultimate success of the process of epithelial inlay, of bone-grafting in the mandible, of cartilage-grafting for various purposes, and of other operations on the orbit, eyelids, and lips, ingenious procedures due to many minds and finding many shapes.

In fact, the rapid development of plastic surgery has been a remarkable vindication of the value of "team work," the team consisting of surgeon, dentist, and artist. Mr. GILLIES was fortunate in having the help of Mr. KELSEY FRY as dental surgeon, and of Professor HENRY TONKS, an anatomist and surgeon who long before the war had deserted medicine for art, but who here found an opportunity for reconciling his double range of great accomplishment. Mr. GILLIES in the preparation of his book has fully recognised the value of graphic record in this branch of surgery. He is throughout sparing of words, but prodigal of pictures and diagrams, so that the work easily achieves lucidity. And this is well, for the general application of the same methods to the conditions met with in civil practice is of immediate importance, although the time may hardly yet be ripe for a department of plastic surgery at a general hospital. The defacements of heredity, disease, and accident are insignificant compared with the results of high explosives. The world of surgery may feel encouraged by the results obtained by plastic surgery in the war, but Mr. GILLIES'S book should go beyond the circle of his professional brethren and be distributed as a deterrent to the politicians of every country, for the things thus put before their eyes might well be a potent factor in promoting peace among the nations.

[1] The Plastic Surgery of the Face. Based on selected cases of war injuries of the face, including burns. By H. D. Gillies, C.B.E., F.R.C.S., Major, R.A.M.C. London: Henry Frowde, Hodder and Stoughton. 1920. Pp. 408. 3 guineas.

Drugs and their Active Principles.

WHEN we consider the many drugs in present use that owe their properties to unknown constituents we must admit that an almost eternal task lies ahead. Senna tea has been the standby of a thousand years of grandmothers; squill and hemp were used as medicines 1500 years ago; gentian was commonly employed in the middle ages—and yet to-day we do not know what gives their virtues to any of these drugs. To go back to even more remote times, there is rhubarb, whose qualities were known 5000 years ago, and yet our knowledge of its active principles is very incomplete. Not long ago there was a sanguine school which believed we were on the threshold of an era in which old methods would be discarded, and that instead of using preparations of raw drugs we should isolate and prescribe the principles which give these drugs their properties. We are almost as far away from this as ever. It is true that research workers have discovered most of the secrets of a considerable list of important drugs, including belladonna, cinchona, ipecacuanha, opium, aconite, and a number of others; but although atropine, quinine, emetine, morphine, and aconitine are readily available in a pure state, the tinctures and other preparations of the new drugs from which these active principles have been isolated are still in daily use. And rightly so.

These reflections result from a perusal of the informative and suggestive address on Progress in Science and Pharmacy delivered by Mr. C. A. HILL, the President of the British Pharmaceutical Conference, at the annual meeting of the Conference held at Liverpool this week. That tincture of nux vomica continues to be prescribed instead of strychnine is not merely because of habit and tradition, but because of the difference between the action of the tincture and the pure alkaloid. This difference, says Mr. HILL, is mainly to be attributed to the effect of the extractive matter in retarding the rate of absorption and in retaining the alkaloid in solution even in the presence of alkaline media which would precipitate pure strychnine. Let us take opium and its alkaloids; it is common knowledge that the replacement of the crude drug by morphine and codeine is far from complete; the reason in this instance is that opium contains more than 20 different alkaloids, possessing varied physiological properties, in addition to several organic acids and other matter. The presence of these substances in opium preparations serves to delay and sustain their action, and since sustained action is often what is required in a narcotic drug it is clear why galenical preparations of opium retain their vogue. Obviously, there are cases where the more rapid action of strychnine or morphine render these alkaloids more suitable than preparations of nux vomica and opium, but there is an abundance of evidence in favour of retainng both classes of medicament. Until quite recently there seemed little doubt that preparations of cinchona bark had been almost superseded by quinine, but the work of Major H. W. ACTON, to certain results of which much importance is attached, indicates that while quinine is useful in the treatment of malignant tertian malaria, it is of small value in eradicating benign malaria; on the other hand, the total alkaloid of cinchona is found by Major ACTON to be effective for the latter purpose. These few examples serve to show that when we have isolated the active principles of drugs our work is not completed. However much we may wrest from her, Nature still holds back some secrets. It may be the presence of other active principles and of apparently inert matter that causes the difference in action, or there may be yet undiscovered and more mysterious causes; for, in Mr. HILL'S phrase, as our knowledge of such bodies as vitamines, enzymes, and hormones advances, so our respect for the natural sources of such bodies increases.

All this suggests possibilities of danger in over-refinement. Search how we may, some drugs have constituents, minute in quantity but of the highest degree of importance, which we have not yet been able to discover. We can only go on working with the prospect that when our work is done we shall find that Nature is still the superior artificer. In the course of his argument the President of the Conference used as an analogy, and we think very aptly, the causation of beri-beri; as is now well known, this disease is caused by the refinements of rice-milling, brought about by the introduction of machinery. The absence of something—belonging to a class now widely known as vitamines—in the rice, removed in the process of steam polishing, was the cause of the trouble. Scurvy, which used to be the scourge of the navy, yields readily to a diet of potatoes, cabbages, and most fresh fruits; sailors in the old days died of scurvy because they were deprived of the vitamine contained in this diet. We think it is permissible to apply both these analogies to the case of drugs. Refine by all means, but let us remember that there may be more danger in our process than in no refinement at all. It is not because we are slaves of habit that galenical preparations of whole drugs are still in some cases preferred to the active principles, but rather because clinical experience, now endorsed by the laboratory, has demonstrated that the crude drug may have advantages over the refined one. Herein is clinical wisdom justified of her children.

Annotations.

"Ne quid nimis."

THE REALM OF NEUROLOGY AND PSYCHOPATHOLOGY.

THE two lectures which appear in full at the front of our present issue are an indication of the amount of keen thought that is being devoted to the subject of nerve symptoms, using this term as Sir Thomas Horder uses it in the widest possible sense. Dr. A. F. Hurst, in his first Croonian lecture, limits himself strictly to a consideration of changes in cutaneous sensation, but finds even within this limit material for an almost new conception of functional nervous disorder. Sir Thomas Horder sets out to help the practitioner faced with a patient taken suddenly ill with a symptom-complex containing elements of a nervous kind. Both tread on ground, broken, indeed, by the neurologist, but on which the practitioner must follow. The first number has recently appeared of a new quarterly journal devoted to neurology and psychopathology, published under the direction of an editorial committee of three in each of the two compartments: Dr. S. A. K. Wilson, Dr. T. Graham Brown, and Dr. R. M. Stewart for neurology; Dr. Bernard Hart, Dr. Henry Devine, and Dr. Maurice Nicoll for Psychopathology; with Dr. Carey F. Coombs as editorial secretary, the journal being

published[1] in Bristol. Two brief and pointed unsigned articles show what is the editorial mind in embarking on the troubled waters of special journalism. The first pictures the realm of neurology invaded on all sides by the doughty protagonists of endocrinology, ophthalmology, psychotherapy, embryology, biometry, eugenics, and many another. Neurasthenia might, indeed, it is humorously suggested, be rescued as the remaining fragment of the neurologist's kingdom were he not "assured by the endocrinologist that it is a disease of the ductless glands, by the alienist that it is a form of mental disorder, by the cardiologist that it is a functional cardiac disturbance, and by the Freudian that it is a sort of nosological Mrs. Harris." The truth is rather that the neurologist of to-day pursues the study of either psychical or physical side, or both, and has succeeded to an empire built up by the scientific and clinical research of many groups and fellowships of workers. The second editorial article carries this thought further and suggests that the most fruitful line of advance at the present time is that of biological reaction, mental and nervous disorders not being distinguished as disease entities, but rather as different types of reaction to environment shown by a psychophysical organism. With these aims we are in cordial agreement, and we believe that a journal in which they are successfully applied will appeal to a very large number of the growing generation of medical students and graduates who have not been brought up to accept without question the dualistic conception of mind and matter, and who feel more at home in the standpoint of the behaviorist, as lately set forth in Professor John B. Watson's admirable book,[2] which is persuasive by reason of being easy to understand. The same cannot be said for the new psychopathology. As Dr. Geikie Cobb very fairly complains in a letter in our correspondence columns, the nomenclature now employed by psychopathologists is nothing short of bewildering to the practitioner engaged in general work, as much in regard to the terms describing the disorders as the mechanism producing them. This obscurity inevitably tends to produce a separate cult instead of the much needed vivifying effect on medical practice in general. The new journal is not quite free from complicity in this evil, for it allows neurologist to abstract neurologist, and psychopathologist to abstract psychopathologist, which perpetuates a vicious circle. Better, surely, might be a trial of the physiologist's crossed-heads experiment. Abstruse work on psychopathology, reaching the practitioner through the medium of the trained neurologist, would not elude him as it does at present. The interpretation of neurology in the light of psychopathology is no less desirable. Is it too much to hope that in this way we might get something like a satisfying presentation of clinical psychology.

THE CASE FOR CASEIN.

THE employment of "protein milk" in infant feeding is reported to be attended with such encouraging results as are likely to upset former theories as to the inferiority of cow's milk compared with mother's milk for the purpose. It was generally held that the excess of casein in cow's milk as compared with human milk embarrassed the child's powers of assimilation, coupled with the strong saline content of the serum or whey. In our own experience in laboratory examination, cow's milk has seldom been modified to an extent which brought the casein, to say nothing of the mineral constituents, down to the level of the natural pabulum of the child. The use of protein milk in the treatment of infantile gastro-enteritis was introduced by Finkelstein in 1910. He suggested an interesting modification of cow's milk, replacing a litre of milk by the clot of casein, produced presumably by the use of rennet, and mixing it thoroughly with half a litre of water to which is added half a litre of butter milk. A suitable addition of carbohydrate is made (3 to 5 per cent.), consisting of a mixture of maltose and dextrin (Soxhlet sugar). It is obvious that by this procedure the proportion of casein remains the same, but the mineral contents of the cow's milk are halved. The notable decrease in the salts of cow's milk, in milk prepared on these lines, diminishes the saline elements conducive to intestinal intoxication. Further, casein so presented, far from causing fœtor of stools, is an excellent antifermentative, and proves easily absorbable in the infantile alimentary tract. It increases, it is stated, the alkalinity of the intestinal juice and prevents auto-intoxication. These observations are based on a paper appearing in the July number of the *International Journal of Public Health*, published by the League of Red Cross Societies, Geneva, by Ad. D'Espine, professor of pathology and diseases of children in the university of that city. Whilst admitting that in the treatment of the gastro-enteritis of infants protein milk is inferior to mother's milk and not to be recommended as a diet for a healthy baby, yet the author concludes that it proves a food of the greatest service in the treatment of the dyspepsias of infancy, hastening recovery and cure. Protein milk, however, must clearly be wanting in accessory food factors unless the casein clot carries with it the fat.

SACRO-ILIAC SCIATICA.

IN the *Revue de Médecine* Professor J. A. Barré, of Strasburg, and Major P. L. Duprey have described a form of sciatica which has received little attention, and which they term "sacro-iliac sciatica"—sciatica due to disease of the sacro-iliac joint. The sacro-iliac joint is in contact with the lumbo-sacral trunk and its large branch, the superior gluteal nerve. Hence peri-arthritis may affect these nerves. In sacro-iliac sciatica there are two elements, articular and nervous, of which one generally preponderates. The mode of onset varies. A sprain of the joint may occur as the result of torsion of the body in playing tennis. The patient is seized with pain in the upper and inner part of the buttock, drops his racket, and puts his hand on the spot. He walks with difficulty, but on resting the symptoms pass off. The same may occur in lifting an object when in a bad position. A pain which is more tolerable and more diffuse follows. After a time, it may be some weeks, the symptoms of sciatica appear. Another mode of onset is by a febrile attack with arthralgias which become localised in the back and in one or both lower limbs. On turning the patient on his side the region of the sacro-iliac joint is found to be swollen and very tender, while the spine is almost painless, except in the space between the last lumbar vertebra and the posterior border of the ileum. This is a case of rheumatic sacro-iliac arthritis. The patient carefully avoids movements of the pelvis or hip, and examination does not allow more to be ascertained than that the posterior part of the thigh is painful. But in a few days the pain almost leaves the sacro-iliac joint and descends. It is most manifest in the thigh and may extend to the foot. In another form patients who have never had a febrile attack suffer from pains in the buttock and have difficulty in walking. They are generally considered to be suffering from chronic sciatica, but, as its signs may be absent for a long time, malingering may be suspected. Careful examination reveals a series of signs of which several have been overlooked—sacro-iliac pain, atrophy of the muscles of the buttock, rigidity of the lumbar spine, contracture of the muscles of the joint, limping, and ascension of the iliac crest. Radiography reveals an ill-marked articular line, decalcification of the ends of the bones, and foci of osteitis. It is a case of sacro-iliac arthritis, generally tuberculous. In sacro-iliac disease pain may be produced in the joint by different manœuvres—by getting the patient to sit down brusquely, to fall, so to speak, on his ischial tuberosities, by pressing the two iliac crests together, or by pressing on the head or shoulders, which tends to press the sacrum like a wedge between the two iliac bones. Often the patient sits only on the buttock of the sound side. Pressure on the whole buttock on the diseased side is painful not merely over the sciatic

[1] The Journal of Neurology and Psychopathology. John Wright and Sons, Ltd. 30*s*. per annum; single numbers 8*s*. 6*d*. post free.
[2] Psychology from the Standpoint of a Behaviorist. J. B. Lippincott, Co. 1919.

nerve, but over the course of the superior gluteal nerve. Neuralgic sciatica is felt specially in the upper part of the thigh and rarely extends below the knee, though in the paroxysms the pain may radiate to the foot. In this sciatic stage the articular pain has diminished or disappeared. There are physical signs in the form of dorso-lumbar scoliosis with the concavity towards the affected side, lowering of the shoulder, and diminution of the costo-iliac space. Owing to hypotonia of the muscles the gluteo-femoral fold is lowered and the furrow between the buttocks is deviated below towards the affected side. In ordinary sciatica the patient suffers more in the calf and foot, and pressure on the course of the nerve produces acute pain; and it is in the leg and foot that atrophy is earliest. In sacro-iliac sciatica atrophy is earliest in the buttock. According to Professor Barré and Major Duprey, sciatica with a painful sacro-iliac point is due to sacro-iliac disease. The treatment consists in using the ordinary anodynes for the pain (aspirin, aconite, gelsemium), hot air, liniments, and massage. In the rheumatic form salicylate is given. The joint is immobilised by applying a binder of inelastic material extending from the iliac crests to the trochanters.

LIMBLESS MONSTERS.

THE case reported last week by Dr. Cawas Homi is an example of a well-known, though uncommon, type of deformity which has always excited interest among medical men and in the laity. As is the case with so many monstrosities, the condition is usually referred by the mother to some strong pre-natal impression. The impossibility of explaining the modus operandi of a maternal impression, or of imagining it in action, is not of much logical weight in considering the matter, but it has so happened that the deformity in most cases must have been produced at a stage in normal development antedating by a greater or less time the occurrence of the impression. This, in conjunction with modern views as to the percentage of all conceptions which become monstrous to some degree, is enough to afford an explanation apart from the impression; but we still lack reliable data concerning the percentage of pregnant women who suffer from ante-natal impressions. The frequent occurrence of other common malformations with the ectromelic state does not agree with the influence of maternal impression. Dr. Homi's case is not open to the objection that the suggested maternal impression came too late in the gestation-period to have its influence, but is an ectromelic case differing in no other way from the rest; it is to be regretted that no expert dissection of the limbs was possible.

IMPROVEMENTS IN THE INDIAN MEDICAL SERVICE.

IN our last week's report of proceedings in Parliament[1] we gave in detail the new rates of pay and other improvements in the conditions of the Indian Medical Service, as stated by Mr. Montagu in the House of Commons on July 12th. They may be summarised, as regards the chief points, as follows: Formerly, a medical officer on joining, with the rank of lieutenant, drew Rs.550 per mensem until promoted to captain, when he received Rs.700. According to the new scale he commences with Rs.650, and after three years' service becomes captain with Rs.800. Formerly, while in the rank of captain, he obtained successive increments of pay up to Rs.750, Rs.800, and Rs.900 after 5, 7, and 10 years respectively; now he draws Rs. 800 during his first three years as captain, Rs.950 in his next three, and Rs. 1050 in his tenth, eleventh, and twelfth years, reaching Rs.1200 on promotion to major after 12 years, instead of Rs.1000 as formerly. After 15 years he draws Rs.1350, and after 18 years Rs.1500, as compared with Rs.1150 formerly from the completion of his fifteenth to completion of twentieth year, or promotion to lieutenant-colonel. After 20 years' service he now draws Rs.1750 (compared with Rs.1550 previously), after 23 years Rs.1850, and after 25 years Rs.1950, and if on the selected list Rs.2100. Charge allowance, varying from Rs.120 to Rs.240, is also issued to officers in command of all except the smallest hospitals, and in the larger hospitals of the first and second class the second in command also draws an allowance of Rs.120 and Rs.90 respectively. Concessions are to be granted with regard to pensions, passages, and leave; and as regards the status of the Director-General and Surgeons-General, these officers are to have the right of direct access to the Viceroy or Governor, as the case may be, and of access to documents the same as possessed by the Secretary to the Government. The improvements indicated, both pecuniary and in regard to official status, appear to have a substantial value and to evince a genuine desire on the part of the Indian Government to meet the legitimate claims of the officers in the Medical Service.

[1] THE LANCET, July 17th, p. 161.

THE VALE OF SIDDEM.

WITH perfect good faith, doubtless, some of our American friends have commented on the evidences of degradation and immorality which they have found when visiting the cities of Europe, and have congratulated themselves on the superiority in these respects of "God's own country." This complacency will receive a shock if they will devote themselves to the perusal of a book which has just reached us from the United States.[1] Its title seems to foreshadow something of poetry, and its format lends support to the anticipation, for the work is one of those neat and modest little volumes with which diffident minor poets are wont to deprecate their indulgence of the *cacoethes scribendi*. There is, indeed, "poetry" in it, for it starts off with the following rhyme:—

> "All the wicked people
> In the Vale of Siddem
> Thought of things they shouldn't do,
> And then they went and did 'em."

Thus are we prepared to face a grim and depressing story. In a valley through which flows one of the tributaries of the Mississippi river, in the State of Minnesota, there dwells a community known locally as "timber rats" and "bark eaters." Its members are the fruit of regular and irregular unions between several families all hopelessly antisocial. Thus we have the Yaks, from one daughter of whose house there were derived 79 persons, of whom 10 were insane, 15 feeble-minded, and 8 epileptic; the first generation including 14 children, of whom 9 were insane and 1 was feeble-minded. Another Yak married into the Bart family. His wife, herself insane, was one of five brothers and sisters, three of whom were insane. These five had among them 14 descendants, 7 of them being either feeble-minded or insane. Delilah of the Cam family was one of 9 children, of whom 7 were feeble-minded. She married into the Glade family, whose record is much the same, and had 11 children, of whom 2 died young, while of the remainder 1 only was of normal mentality. "Muskrat Charlie" married a feeble-minded woman and had 11 children, of whom 3 died shortly after birth and the rest were feeble-minded. So the story goes on. Summed up, of 1619 dwellers in the Vale of Siddem 892 furnished no sufficient information for any report, 114 died in infancy or early life, and of the rest there were only 156 who could be regarded as normal; 199 were feeble-minded, 34 insane, 125 sexually immoral, and 134 alcoholic—i.e., individuals who drank "habitually and to excess." Of the feeble-minded only about 5 per cent. have been reached by the available agencies for care and control. The outlook could hardly be less satisfactory. As the authors themselves put it: "From the standpoint of eugenic consideration the existence of such communities as the Vale of Siddem makes our present attempts to care for the feeble-minded quite idle. The sources of the apparently inexhaustible supply of mental defectives remain unaffected. It is like trying to stamp out malaria or yellow fever in the neighbourhood of a mosquito-breeding swamp."

[1] Dwellers in the Vale of Siddem. By A. C. Rogers and Maud A. Merrill. Boston: Richard G. Badger, The Gorham Press.

POST-GRADUATE MEDICAL STUDY IN LONDON.

WE have received from the Deans of the Post-Graduate College, West London Hospital (Dr. Arthur Saunders and Mr. Bishop Harman), the prospectus of the Special Vacation Course arranged for the month of August. There will be daily demonstrations and lectures; the subject of each of these is stated in the time-table, and deals with some aspect of medical practice which must be of interest to every practitioner. The full clinical work of the hospital will be available for medical practitioners in the medical, surgical, and special departments. Arrangements have been entered into between the College and certain special hospitals to give facilities to post-graduates in these hospitals—e.g., Brompton has entered into this alliance, to the evident advantage of practitioners who wish to take out a general course and yet desire to do more work on tuberculosis than a general hospital can provide.

DR. COOLIDGE'S SERVICE TO RADIOLOGY.

Dr. W. D. Coolidge delivered an address before the members of the Rontgen Society on July 15th in the new Chemical Theatre of University College. There was a large and representative audience, including a number of the leading scientists and medical men interested in radiology. Dr. Coolidge in his opening remarks paid a striking tribute to the pioneer work done in Britain on the physics of X rays and allied subjects, referring particularly to the work of the late Sir William Crookes, Rutherford, the Braggs, Wilson, Richardson, and others. The lecturer gave an interesting description of the research laboratories of the General Electric Company at Schenectady. From his detailed description of these laboratories it is clear that the equipment of such centres for the practical application of the discoveries of pure science to commerce leaves very little to be desired. He went on with a most interesting description of the steps in the production of ductile tungsten, illustrating the procedure by a number of lantern slides. He described many interesting technical details necessary for the production of a form of tungsten suitable for, amongst other things, the essential parts of an X ray bulb. The most striking feature of this part of the address was the evidence of the infinite care and attention to detail which are required in the handling of this most difficult of metals. Although the lecturer modestly made no reference to the fact, it is well known that the research work in the elucidation of this problem has been carried out by Dr. Coolidge himself. The production of ductile tungsten paved the way for a great advance in the design and construction of the X ray tube. Up to the advent of tungsten in working quantities platinum was used for the target of the X ray tube. Tungsten possesses several advantages over platinum, and soon it displaced to a large extent the latter metal. The very clear description of the methods by which a tungsten button was fixed upon the copper target of the tube enabled the lecturer's hearers to grasp to some extent the skill requisite for the manufacture of a modern X ray bulb. This part of the lecture dealt with the physical and chemical properties which complicate the making of a gas tube. To the radiologist this was most interesting, and helped to explain many of the vagaries of the X ray tube when in action.

The lecturer next proceeded to deal with the further developments and the experimental work which culminated in the production of the tube which bears his name. Needless to say, the metal tungsten enters largely into its construction, the anode and part of the cathode being made of that substance. The standard tube was next described in detail. A large number of interesting experiments were described and illustrated on the screen. The radiation from the target and stem was beautifully demonstrated by a number of pin-hole photographs. The discovery that X rays are given off from practically the whole of the target and stem was at first a rather disconcerting factor. It became necessary to ascertain the exact effects these rays might have upon the quality of the radiographs. Accordingly, a number of experiments were carried out to settle this point. A metal hood was placed in relation to the target; in this were two small openings, one in the axis of the cathode stem, the other at right angles to it. It was found that by this method a large percentage of the stray radiations were prevented from reaching the plate. A small metallic screen introduced into the interior of the tube served the same purpose. Dr. Coolidge next proceeded to estimate the effect of these radiations. He found that the percentage of radiation from the back of the tube was roughly one-tenth of that from the front surface. Nevertheless in practical work, so long as the exposures were relatively short, no very obvious effect was observed on the photographic plate. Another most interesting point, from the radiographic point of view, was the influence of the size of the focal spot on the target upon the sharpness of the radiographic image. An ingenious series of experiments was devised in which both the anode and the cathode could be moved either towards or from one another. The results of these experiments had an immediate practical bearing.

Having dealt fully with the experimental data, Dr. Coolidge proceeded to describe and demonstrate the latest forms of the best cathode tube. Recent models have been reduced in size and have been standardised. The small tube consists of lead glass. Opposite the target is a window of ordinary glass which allows the X rays to pass through. The standardisation of the apparatus used for exciting the X ray tube is another development which has now become possible with the best cathode tube. The demand appears to be for a small portable apparatus which will produce good radiographs almost automatically. This has its advantages, but there are also dangers. The simplification of technique may induce medical men who are not familiar with the dangers attendant upon the use of X rays to venture on such work without counting the cost. The latest forms of the Coolidge tube were described and reference was made to the portable form of transformer. The development of apparatus on the lines indicated should lead to simplification of technique and an approximate standardisation of exposures in radiography. The advantages in therapeutic work will then be immediate. With the tube and transformer immersed in oil it should be possible to obtain with care a greater spark length than is possible with the usual method. In air the difficulty is to prevent sparking when high voltages are employed. In Germany, for instance, the Coolidge tube is made with very long terminals, and it is claimed that spark lengths up to 15 inches are employed in therapy. The oil immersed type of apparatus should make it possible to obtain equally high voltages with the small radiation type of tube. This is an advance likely to play a great part in radiography, for the quality of the radiations from one tube can now be varied from ½ inch up to 15 inches spark length, giving a range of wave length which makes it possible to radiograph objects of low atomic weight, such as flowers, at one end of the scale, while at the other it is possible to get a radiograph through 2 or 3 inches of steel. It is difficult to over-estimate our indebtedness to Dr. Coolidge for the valuable work he has carried out. From the medical point of view alone it is sufficient to state that only those radiologists who have had experience of the Coolidge tube in radiography and therapy are in a position to estimate the revolutionary part it is already playing in their daily work. The discovery of X rays by Rontgen was the first step in a new science. The perfection by Dr. Coolidge of the best cathode tube is another of the great landmarks in the history of X rays.

SELF-SUPPLIERS OF MORPHINE IN FRANCE.

As in this country, the sale of morphine to the public in France has recently been drastically curtailed by law, and the interesting point has arisen whether the medical man is or is not subject to the same restrictions as his patient. Certain medical men, accustomed to obtain medicaments for their own use, not merely by signing an ordinary prescription but by giving an order

for them on a larger scale, recently came into court charged with having obtained from pharmaceutists quantities of morphine in excess of those prescribed by law for the ordinary patient who is, in addition, obliged to obtain a weekly renewal of his medical prescription. Five of these medical men, who appeared before the judicial tribunal of the Seine, pleaded respectively gout, an affection of the lungs, of the heart, of the nerves, and of the kidneys, along with the right to treat their own maladies themselves if they wished to do so. They were acquitted by the tribunal, which recognised the medical man's right to obtain medicaments wholesale, the verdict running, "the doctor who treats himself does so in the exercise of his profession."

PRECANCEROUS LESIONS OF THE VULVA.

As the normal variations in the senile involution of the vulva after the menopause have received but little attention in anatomical and gynæcological literature Dr. F. J. Taussig,[1] visiting gynæcologist to the Barnard Free Skin and Cancer Hospital, St. Louis, has made a careful study of the vulva in 100 women beyond the menopause, noting the age, number of children, age at menopause, general condition of the skin (dryness, elasticity, freckles, keratosis, nævi, &c.), and the local genital condition (size of labia minora and clitoris, dryness, colour, elasticity, scars, presence of vaginal discharge, &c.). Apart from vulvar atrophy, all forms of which were encountered in the normal vulvar skin at this age, four distinct pathological conditions were found—viz., pruritus vulvæ, kraurosis vulvæ, leukoplakic vulvitis, and carcinoma. Pruritus, which in spite of frequent lack of cleanliness was only rarely present, was not accompanied by vulvar atrophy and showed no tendency to malignant changes. The elastic tissue was of normal amount and distribution. Kraurosis vulvæ was associated with an extreme degree of vulvar atrophy and also showed no tendency to malignant degeneration. In leukoplakic vulvitis the skin changes consisted primarily in an absorption of elastic tissue from the uppermost layers of the corium of the vulva internal to the hairy portion of the labia majora. Although some writers have attributed leukoplakic vulvitis to syphilis, the Wassermann reaction was positive in only two of the present series of 19 cases, and neither of these showed active syphilitic lesions. Moreover, the disease is primarily one of old age, whereas syphilis in an active form occurs chiefly in younger persons. Leukoplakic degeneration shows a marked tendency to malignant degeneration. Perruchet found carcinoma in 16 out of 19 cases, and in Dr. Taussig's series 14 out of 20 cases developed carcinoma. Among 9 cases in which carcinoma was present unassociated with leukoplakic vulvitis, in 2 tertiary syphilitic ulceration was definitely associated with the cancerous process, in 2 there was a definite history of trauma, in 1 the cancer developed from the edge of a typical acuminate wart, and in 4 no ætiological factor could be found.

THE WORK OF THE SCOTTISH BOARD OF HEALTH.

THE first annual report of the Scottish Board of Health, just issued, deals with the year 1919. Schemes for housing are being satisfactorily prepared by local authorities. In consideration of plans submitted, the view has been taken that approval of houses of less than three rooms would not be justifiable excepting in very exceptional cases, and in one instance only have two-roomed houses been agreed to. Endeavour has been made where possible to have houses provided with larger accommodation than three rooms. The cost of the houses still remains unfixed owing to the uncertainty in the rates for wages, cost of materials, and transport. Much time has been spent by the Board in considering the various schemes framed by local authorities for the prevention, detection, and treatment of tuberculosis. The number of institutions approved at the close of the year for the treatment of tuberculosis was 118, being 96 sanatoriums and hospitals and 22 tuberculosis dispensaries. The number of beds was 2694, being 1 per 1767 of the population. Arrangements for domiciliary treatment continue as before, but the amount allowed per patient for expenditure on medical comforts has been raised from 7*s*. to 10*s*. weekly. Scarcity of labour and rise in costs have deterred local authorities from proceeding rapidly with their plans, and the time allowed by the Treasury for the submission of these has been extended. The original grant of £60 per bed in respect of new buildings has been increased to £180 in the period under review. There does not appear to be any drop in the number of discharged soldiers requiring institutional treatment for tuberculosis. The arrangements made provide for priority of treatment, and except in cases where treatment was refused, a suitable period of residence in a sanatorium or hospital has been provided. School medical services suffered severely as the result of the war, but with the return of normal conditions rapid development is expected. These services deal with a total school population of about 850,000. Of these about one-third are systematically examined annually, while a large number are examined as special cases in addition. The Board has in course of preparation a memorandum on school health administration which it proposes to issue to school authorities at an early date. A central register of the blind is now almost complete, and statistics are in course of preparation showing the country, age, occupation, income, and cause of blindness, of all blind persons in Scotland. The number of Approved Societies in Scotland at the close of 1919 was 240, having a total membership on July 1st, 1918, of 1,533,923. A careful scrutiny of official audits continues to be made with a view to pressing societies to remedy defects disclosed. There is a notable improvement in the bookkeeping of the smaller units. Eleven out of 72 Scottish societies have net deficiencies, while of 25 international societies with head offices in Scotland 6 have net deficiencies. Taking all 97 societies together, there is an excess of £32,000 of total surpluses over total deficiencies.

Sir James Mackenzie has been appointed Honorary Physician to the King in Scotland, in the room of Sir Thomas Richard Fraser, deceased.

RESTRICTION OF THE OPIUM TRAFFIC.—The Edinburgh Anti-Opium Committee, formed for the purpose of promoting the objects of the Hague International Opium Convention, states in a pamphlet just circulated that the friends of the anti-opium cause had for years been expecting that when the Hague Convention came into operation the opium traffic in India and all over the world would cease, except for legitimate—i.e., medicinal—purposes. But a letter dated June 26th from the India Office and signed for the Secretary of the Revenue and Statistics Department, contained the passage:—

"The Government of India do not admit that the opium used in India, or exported, is 'abused'; they do not consider it advisable to limit the export of opium from India to the amount required solely for 'medicinal' purposes; and they do not accept the suggestion that India should prohibit the export of opium in order to force, or to attempt to force, the countries which now receive their supplies from India to abandon their present opium policy. In this connexion, I am to point out that the Hague Convention contemplates, and provides for, the use of opium for other than purely medicinal purposes; it does not stigmatise the use of opium for such purposes as an 'abuse'; and it places the responsibility for regulating the import of the drug, and the derivatives, upon the importing country."

The Edinburgh Anti-Opium Committee, which has Dr. A. H. F. Barbour as chairman of its executive, has replied by passing the following resolution, copies of which have been sent to the Prime Minister and to the various heads of the departments concerned:—

"The Committee thank the Government for the prompt introduction of the Dangerous Drugs Bill, and trust that facilities will be given for its speedily becoming law; they, however, desiderate in it a more definite restriction of both 'raw opium' and morphia and cocaine to medical requirements, which they believe to be the intention of the Hague Articles, when taken as a whole; they also trust that the provisions of the Bill will be extended to India and other Eastern Dependencies, according to the terms of the declaration of the British signatories at the Hague, which says, 'The Articles of the present Convention shall apply to British India, Ceylon, the Straits Settlements, Hong-Kong, and Wei-hai-Wei, in every respect in the same way as they shall apply to the United Kingdom and Ireland.'"

[1] Archives of Dermatology and Syphilis, June, 1920.

THE BRITISH MEDICAL ASSOCIATION.

EIGHTY-EIGHTH ANNUAL MEETING AT CAMBRIDGE.

SECTION OF MEDICINE.

WEDNESDAY, JUNE 30TH.

THE first session, with Sir HUMPHRY ROLLESTON, President of the Section, in the chair, was occupied with a discussion on the

Nervous Disorders of the Stomach and Intestine.

The opening paper was read by Dr. ARTHUR F. HURST (London), who said that functional disorders of nervous origin were of two kinds: the neuroses, which were independent of mental processes, whether conscious or subconscious; and the psychoneuroses, which had a psychical cause, the latter alone being amenable to psychotherapy. By hysteria he meant a condition in which symptoms were present which had been produced by suggestion and were curable by psychotherapy. He and his fellow-workers had confirmed Babinski's observations that Charcot's physical stigmata were invariably a result of suggestion on the part of the observer, and though an abnormal degree of suggestibility predisposed to hysteria it was not an essential part of it, and hysteria might occur in individuals with a perfectly normal make-up.

The traditional description of the nervous disorders of digestion depended on false ideas of anatomy and physiology. It was assumed that a certain degree of tone and a certain activity of peristalsis were normal, and that a normal stomach secreted juice of a certain strength, and any divergence from these standards was regarded as evidence of disordered function. But his own investigations and the recent chemical investigations by fractional test-meals, carried out by Reyfuss and Crohn in America, and by Ryle and Bennett at Guy's Hospital, had shown that such great variations occurred in the muscular tone, peristalsis, and secretory activity of the stomach in normal individuals that the conditions generally known as atonic dilatation, hyperchlorhydria, and hypochlorhydria might really fall within normal limits. The discovery of variations from the average normal tone, peristalsis, and secretion in persons with digestive symptoms was therefore no evidence that these variations were in any way responsible for the symptoms.

There was not the smallest evidence to show that true neurasthenia in any way affected the motor or secretory functions of the stomach. Though there was little justification for retaining such terms as atonic dilatation of the stomach, hyperchlorhydria, hypochlorhydria, atonic and acid dyspepsia, as descriptions of clinical conditions, there were two varieties of neurasthenic dyspepsia which could only be recognised with certainty with the aid of X rays and gastric analysis—the atonic, occurring in an individual with a stomach having less than the average tone and secretion, and the hypertonic, occurring in one with a stomach with more than the average tone and secretion.

Hysterical vomiting was a condition that occurred frequently, especially in gassed soldiers. Whatever its original cause, auto-suggestion led to its aggravation whilst the primary cause was still present, or to its perpetuation after the latter had disappeared. He came to the conclusion that whenever vomiting persisted for more than a month after gassing it was certainly hysterical. The most important of all forms of hysterical vomiting, which had led to the death of many mothers and of still more unborn infants, was the so-called "pernicious vomiting of pregnancy."

Dr. Hurst had not yet seen a case in which immediate recovery did not follow psychotherapy. It had been proved conclusively that the disturbed metabolism was due to starvation and dehydration, and was not an indication of some obscure toxæmia. We were often too ready to accept our patient's own diagnosis. He said he was suffering from flatulence, and we treated him with diet and antiseptic drugs for flatulent dyspepsia. Careful investigation had shown that fermentation very rarely occurred in the stomach, which empties itself too rapidly and secretes a juice which is too acid for any appreciable amount of bacterial activity to occur. The only common cause of flatulence was aërophagy, which was a psychoneurosis, and, like all hysterical symptoms, could be readily cured by pure psychotherapy.

Passing to nervous disorders of the intestine, Dr. Hurst said that in his experience the symptoms generally ascribed to auto-intoxication caused by intestinal stasis were really produced by purgatives, which led to the absorption of excess of toxic material, partly by hastening the half-digested contents of the small intestine into the cæcum, where fermentation and putrefaction were consequently increased, and partly by causing the contents of the transverse, descending, and pelvic colon to be fluid instead of solid, so that absorption of toxins took place throughout the length of the bowel instead of in the cæcum and ascending colon alone. The majority of cases of dyschezia, or inefficient defæcation, which was the commonest form of severe constipation, were of nervous origin. In many cases no treatment was required beyond explaining to the patient the nature and cause of his condition and persuading him to make an effort to empty his rectum, but occasionally it was also necessary to re-educate the rectum with graduated enemata. When a patient complained of auto-intoxication and intestinal stasis, and gravely discussed the question of kinks and adhesions, producing a diary in which every motion he passed was minutely described, the diagnosis of intestinal hypochondriasis was obvious. The patient should be taught that his auto-intoxication was the result of drugging, that intestinal stasis in moderation was a virtue, as it promoted digestion and absorption of his food, and that we all had kinks and adhesions, and so long as they remained in the abdomen and did not get on the brain they did not really matter. He alone was happy and devoid of that most trying of nervous disorders of the bowel—hypochondriasis—who followed Sir James Goodhart's admirable advice to do as the dogs do and never look behind him. Nervous diarrhœa occasionally occurred which might be considered hysterical, but it was necessary in every case to discover what was the nature of the suggestion which caused the diarrhœa. In most cases the original attack of diarrhœa was emotional in origin, over-activity of the bowel being one of the rarer of the many physical symptoms of emotion. The symptoms having been caused by suggestion could be cured by psychotherapy.

Muco-membranous colitis when not associated with organic disease might be regarded as a neurosis, as it occurred in exhausted individuals whose nervous systems had become abnormally irritable. So long as the patient did not know she was passing mucus she was comparatively well, but when a course of Plombières treatment had made her a connoisseur in fæces a mental element was added which it was often difficult to remove. But get her away from her devoted parent, her purges, and her Plombières and she would soon be free from her psychoneurosis; the muco-membranous colitis, the pure neurosis, might still be present, though it required but little treatment beyond wholesome neglect.

In conclusion Dr. Hurst hoped the discussion would lead to a satisfactory classification of gastric and intestinal neuroses based on observed facts.

Dr. T. I. BENNETT gave a demonstration by charts shown on the screen of the result of some of the investigations which he had made on the secretory functions of the stomach, assisted by several students of Guy's Hospital. Chemical examinations were made every quarter of an hour of the contents of the stomach. He found that the estimation of the acidity of the gastric contents was often grossly fallacious, as he had discovered both hypochlorhydria and hyperchlorhydria in perfectly normal students. He had proved the profound influence of the nervous system on the chemical constituents of the stomach by hypnotising individuals while test meals were being given. A suggestion of hunger caused a marked rise in the HCl curve, and the rate of emptying the stomach was much affected by various emotional suggestions.

Dr. T. R. BROWN (Baltimore) considered that it was a dangerous doctrine to promote that all the cases in question were of nervous origin. Cases frequently occurred which were at first supposed to be hysterical, but afterwards turned out to be of organic origin. He specially referred to obscure cases of gall-bladder disease which were often unrecognised at first. He thought a fundamental principle to apply was that enunciated by Sir Clifford Allbutt—that everything in disease was correlated. The patient should be studied by every known method before coming to the conclusion that the disease was not organic.

Dr. LANGDON BROWN (London) agreed that cases which were supposed to be neurotic often turned out to be of organic origin. He made some observations about the distribution of the nerves of the stomach, and protested against the too rigid diet often ordered in diseases of the stomach. We should make sure that if our treatment did no good it should not at least do any harm.

Dr. J. A. NIXON (Bristol) thought too much stress should not be laid on the psychical factor in these diseases, as there was a danger of overlooking the organic basis, which might be a very small one.

Mr. H. TYRRELL GRAY (London), speaking from the point of view of a surgeon, thought that any advance in the diagnosis of these diseases was to be brought about by a closer association between the physician, the surgeon, and the physiologist.

Professor R. J. BUCHANAN (Liverpool) expressed his belief in hysterical stigmata, a striking instance of which he related, the subject being a man one side of whose face was found covered with flies quite unknown to him, the condition being anæsthesia of that part. He said there were two schools of thought on the subject—the physical and the psychical—but it was necessary to study the subject in all its aspects. In his opinion functional diseases of the stomach were becoming fewer and organic affections more common, and the diagnosis of "hysterical stomach" was often due to the exhaustion of diagnostic resource.

Dr. W. J. TYSON (Folkestone) confessed his inability to diagnose these cases, and remarked how some of them got well after operation and others got well without operation. He did not think we had reached bottom at all in the diagnosis of these cases, but he thought Dr. Hurst's paper would do an immense amount of public good if it checked the self-prescription of purgatives, though he feared it would interfere with the trade of the chemists.

Lord DAWSON said that organic disease often began in a most insidious way. If he made a diagnosis of nervous dyspepsia in a patient he constantly reviewed that diagnosis and tried to upset it if possible. It was important, however, to give the patient a definite diagnosis, for which reason he approved of the term "colitis." There was a danger of allowing patients to become too introspective, and he always found doctors and nurses the worst patients, as they were inclined to attribute their symptoms to the very worst forms of disease they knew of.

Other speakers in the discussion were Dr. R. G. GORDON (Bath), Dr. E. HOBHOUSE (Brighton), Dr. LIBMAN (New York), Dr. CRAVEN MOORE (Manchester), and Dr. R. C. PARSONS (Dublin). The general opinion seemed to be that there was a danger of laying too much stress on the neurotic element, and thus possibly overlooking organic changes and of trusting too much to pyschoanalysis.

Dr. HURST replied, and stated that his method of psychoanalysis simply consisted in a close cross-examination of the patient and an endeavour to ascertain the origin of the symptoms.

THURSDAY, JULY 1ST.

Interest in the second day's proceedings was evidenced by a crowded meeting of members, the subject for discussion being the

Present Position of Vitamines in Clinical Medicine.

The opening paper was read by Professor F. GOWLAND HOPKINS (Cambridge), who said that the modern conception of a deficiency disease was not, of course, based wholly upon a belief in the existence of vitamines. There might be quite other factors of deficiency in a diet which might produce symptoms to be observed clinically, but the hypothesis of vitamine deficiency played a large part in current views concerning the chief examples of the conditions to be discussed.

Professor Hopkins described certain experiments which he had performed, which dealt with the conditions which affected the stability of the so-called fat-soluble vitamine, and the results showed definitely that oxidation played a much larger part in the conditions which destroyed it than did temperature.

Curves were shown on the board which represented average body-weight changes in two strictly comparable groups of rats. The two groups were fed side by side on a dietary absolutely identical in every particular save one. In the food of one set the fat was butter which had been heated for four hours to 120° C., but heated without aeration. The fat given to the other set was the same butter heated in exactly the same way, but during the heating a stream of air was bubbled through the melted fat. As the curves showed, growth in the first set was perfectly normal, while in the case of the second set, though the rats consumed the food satisfactorily, growth continued but for a short time, and the rats then steadily lost weight. Shortly after the end of the period covered by the curves (some 60 days), while the first set of rats remained in perfect health, all those in the second set were dead.

It was easy to show that nothing toxic developed in such aerated fat. Animals taking it in their food after a relatively small amount of normal unheated butter had been mixed with it were maintained in health, and if half of it had been replaced by normal butter they grew well. Clearly the treatment had produced some deficiency. That it was legitimate to speak of the effect as one involving a destruction of the fat-soluble vitamine was shown by the fact that the rats fed on the altered butter showed just those appearances which were peculiar to others fed upon such vegetable fats as were believed to be free from that substance. The suggestion of the experiments was that the vitamine had considerable heat-stability, but that it was easily oxidised—a point of some practical importance.

It was most important to remember that the absence of a specific factor from the food produced results very different from those that followed actual starvation. In the latter case the energy requirements and other demands were met from the tissues, and there was rigid economy of effort and material. But when an individual's diet was deficient in a vitamine he might still be dealing with large quantities of total food. The metabolic machinery might be working at full pressure while nevertheless deprived of some essential wheel or cog.

If there was one clinical condition in which the influence of a deficiency seemed obvious, direct and but little complicated, it was certainly scurvy. There was no more striking evidence to show that the antiscorbutic substance (if there was only one) was of a special nature, coming under the definition of the vitamine, than the fact that while absent rom dry grains it appeared suddenly when the grains germinated.

There was no doubt about the prime importance of the food factor in treatment. The recent quantitative studies at the Lister Institute had yielded results of extraordinary importance, and would put the therapeutics of scurvy upon a really scientific basis. The so-called xerophthalmia, which was a late result of feeding animals upon food from which the fat-soluble accessory was absent, was an extraordinary phenomenon, coming on very suddenly about the fortieth or fiftieth day of deprivation. It commenced as a corneal opacity, and often in a few days there was complete panophthalmitis; the cornea might perforate and the lens extrude. Caught at an early stage the process could be wholly arrested by administering butter, cod-liver oil, or any substance containing the fat-soluble accessory, though in no other way.

The question of rickets was one which was still much debated, some observers believing in the prime importance of defective hygiene in its ætiology, and others pinning their faith to vitamine deficiency as its causation. Professor Hopkins remained a firm believer in the influence of a specific diet deficiency, at least, in experimental rickets as displayed by dogs, because in Dr. and Mrs. Mellanby's experiments[1] he had seen carefully controlled observations showing unequivocal results. Other experiments, especially those of Dr. Hess and Dr. Unger, seemed to show that deficiency in the fat-soluble vitamine had little to do with rickets. That more than one factor was concerned in the causation of rickets seemed sure; their relative importance remained yet to be determined.

Sir JAMES BARR (Liverpool) said that he had recently had a conversation with a director of one of the largest manufactories of margarine in the United Kingdom, turning out 3000 tons a week, who told him that margarine usually gave rise to rickets, but they were determined that their margarine should not soften the bones of children or any other animal. On scientific advice they were recommended to add a certain proportion of animal fats, but as these were not obtainable they tried the next best thing—viz., yolk of eggs, and they therefore added 64 yolks to each ton of margarine. As he himself ate two eggs every day he found he would have to consume 70 lb. of margarine daily to obtain the necessary vitamines. He therefore preferred to wait until it was available in tablet form. He considered that vitamines were an indispensable substance or substances, which had never been isolated and whose composition was uncertain. He preferred lymphagogues, like calcium salts, of which he knew something, and would allow others to swallow tons of unpolished rice in order to get some imaginary vitamines about which they knew nothing.

[1] THE LANCET, 1919, i., 407.

Dr. HARRIETTE CHICK and Dr. ELSIE DALYELL gave an interesting account of their experiences and experiments in Vienna, and threw on the screen several remarkable photographs of children, and charts showing the emaciated condition of these children and extreme conditions of rickets, all of which had been immensely benefited by adding to their diet various fat-soluble substances, such as butter and cod-liver oil, and also by administering antiscorbutics.

Lieutenant-Colonel R. MCCARRISON, I.M.S., said that on the previous day, in the Section of Tropical Medicine, he had emphasised the effects on the endocrine organs of four factors :—

(1) Deficiency of vitamines.
(2) Deficiency of soluble protein.
(3) Disproportionate richness in the dietary of starch or fat, or both.
(4) The fortuitous occurrence of pathogenic agents in the body.

To-day he wished to emphasise the same thing in the causation of deficiency diseases, such as rickets and scurvy. He exhibited on the screen several photographs of the stomach and intestines of monkeys, and believed that the same conditions occurred in human beings. In general the symptomatic manifestations of dietetic deficiencies were :—

(1) Dilatation of the stomach ; (2) indigestion ; (3) deficient action of the liver and pancreas ; (4) air locks in the small intestine ; (5) failure of neuro-muscular control of the gastro-intestinal tract ; (6) a tendency to intussusception and to the formation of gastric ulcer ; (7) most important of all, colitis.

He had found that when monkeys were fed on a diet excessively rich in starch there was an increase in the weight of the brain by one-seventh of the normal, and this would give rise to confusion of ideas.

Dr. ALFRED HESS (New York) referred to the value of dried milk, 2 oz. of which were equivalent to 1 pint of fluid milk. He said that beneficial results from dried milk depended on the kind of milk used in its preparation ; the milk must have been obtained from cows receiving a liberal ration, and must have been dried quickly. With regard to vegetables, an important factor was the soil on which they were grown. He had found that one diet which gave rise to rickets was the so-called protein milk diet. Precipitation of the curds by means of heat led to rickets in about 75 per cent. of babies. He regarded cod-liver oil as almost a specific for rickets.

Dr. G. F. STILL (London) suggested as a reason why some infants did not suffer from scurvy though fed on similar food to those who did develop the disease that those who were at first immune started life with a certain capital of vitamines derived from their mothers, that they lived on this capital for a time, but sooner or later became bankrupt as far as vitamines were concerned. Certain proprietary foods figured much more largely in the history of scurvy than others, and he had seen several cases in which fruit juice had been given for months without preventing the disease. He had found baked potatoes a most important prophylactic of scurvy, but believed, like Dr. Hess, that the soil on which the potato was grown, or the particular kind of orange, or its degree of ripeness, were factors to which sufficient attention had not been given. At present one waited on the bio-chemist for the possibility of stating the exact value of any particular food in units of vitamine. When he was able to do that we should have a means of exact clinical investigation and treatment which at present was lacking.

Dr. LEONARD WILLIAMS (London) said that the community at the present day was hypercivilised. If we knew anything of vitamines it was that they were contained in uncooked food. The community lived upon food from which vitamines were rigidly excluded. We boiled our milk, steamed our vegetables, and cooked our fruit. That was done from a combination of pleasure and fear ; pleasure, which he confessed that he himself shared in the enjoyment of the foods so cooked, and fear of the microbe. In cooking it was not only the vitamines which were destroyed but other vitalisers. In our insane fear of our enemies we slaughtered our best friends. An uncooked dietary was, in his opinion, specially good in rheumatism and middle-aged arthritis, also in gastric and duodenal ulcer, and with its adoption constipation and intestinal stasis disappeared. Its results were no less wonderful than those of the thyroid treatment of myxœdema.

Dr. W. H. WILLCOX (London) referred to experiences in the Mesopotamian campaign, in which scurvy and beri-beri occurred to a great extent.[2] Owing to the intense heat and the difficulties of transport, the provision of supplies of fresh fruit and vegetables to the troops in the fighting area was impossible for a certain period. A most serious outbreak of scurvy occurred among the Indian troops in 1915–16. There were over 11,000 cases from July 1st to Dec. 31st, 1916. The men's diet was adequate in calories, having sufficient protein, fat, and carbohydrates, but was entirely free from antiscorbutic vitamines. As soon as it was possible to issue articles containing the necessary accessory food factors the epidemic ceased. Cases of beri-beri also occurred among British soldiers, but the Indian troops remained free from beri-beri, because the main part of their diet consisted of atta—a coarsely ground wheat flour containing the germ and aleurone layers of the grain, in which the necessary accessory food factors were present. They also had a daily allowance of 4 oz. of dhall, small lentils, whole or split.

Dr. ERIC PRITCHARD (London) said that none of the theories as to vitamines explained the pathology of rickets. All conditions of malnutrition created a demand for calcium, and in rickets the bones were starved because the calcium was required for more important purposes. Rickets was more properly called an excess disease than a deficiency disease, and it would be more appropriate to call it a condition of want of balance.

The following speakers also took part in the discussion : Dr. J. C. DRUMMOND, Dr. H. C. CORRY MANN, Dr. S. MONCKTON COPEMAN, and Dr. R. L. MACKENZIE WALLIS (all of London), Dr. C. MUTHU (Wells), and Dr. J. BROWN (Blackpool) ; and Professor HOPKINS replied.

FRIDAY, JULY 2ND.

A discussion on the clinical significance and course of

Subacute Bacterial Endocarditis

was opened by Sir THOMAS HORDER, who said that we must exclude from our view rheumatic endocarditis, ulcerative endocarditis, which was but a part of an acute pyæmia, and that form of bacterial endocarditis which occurred as a terminal event in chronic diseases. Subacute bacterial endocarditis was the accepted name of a disease having more or less of the following features. The onset was most often insidious ; the general symptoms included loss of strength and tone, a sallow complexion with anæmia, moderate loss of weight and fever ; the heart gave evidence of endocarditis at some time or other in almost all cases, and in the majority there had been previous valve injury ; widespread arterial embolism occurred ; in most cases blood cultures were positive, the isolated bacterium being either a short streptococcus, much less often Pfeiffer's bacillus, and rarely a micro-organism difficult of identification, but in all cases the microbe was of low pathogenicity. The course of the disease was slow but progressive, and although remissions occurred, it was, once established, almost invariably fatal. The total duration of the illness was from three months to two years, with an average duration of six months ; death occurred from toxæmia, from heart failure, from anæmia, or from cerebral or coronary embolus. The post-mortem findings included a vegetative endocarditis on the valves or wall of the heart, with little or no ulceration, and widespread embolic infarction without suppuration. As a result of the embolic process there was found a form of glomerular nephritis more or less characteristic of the affection. The disease was fairly common. From his own investigations he had found that 1 in 200 patients admitted to the medical wards of a large general hospital suffered from subacute bacterial endocarditis.

[2] THE LANCET, 1917, ii., 677.

Most of the cases occurred between the ages of 15 and 50 and half of them between 20 and 40. In about half the cases met with there was a history of acute or subacute rheumatism or chorea. The existence of old-standing valve lesions was of great importance in the ætiology. There were four cardinal signs of the disease when it was fully evolved. Arranged in the order of their importance from the point of view of diagnosis they were: multiple arterial embolism, endocarditis, the isolation of a bacillus from the blood stream, and fever.

1. *Multiple arterial embolism.*—Close study of the clinical and of the morbid anatomical material available revealed the facts that many more organs and tissues were found to be affected by infarction than was formerly known to be the case, and that many of the emboli were of microscopic size, little else than microbic metastases in fact. These two considerations were of very great importance in the clinical and clinico-pathological investigations of a suspected case. Petechiæ on the skin were very frequent harbingers of more certain signs. Isolated and pioneer petechiæ were common about the regions of the clavicles and at the base of the neck; those situations should be carefully examined. Even more decisive from their diagnostic significance were the painful and discoloured patches or nodes that appeared on the terminal phalanges of the hands and feet, especially on the pads of the fingers and toes. Those patches were doubtless embolic in origin, the affected vessel lying in the deep layer of the skin or in the soft parts beneath the skin.

Many of the symptoms referable to joints and periarticular structures were doubtless embolic in origin, as they lacked the symmetry of true rheumatic joint affections, there was much less tendency to synovial effusions, and focal œdema and discolouration were common in the overlying skin. Also the situation of the pain and swelling was not seldom one rarely seen in true rheumatism—e.g., the dorsum of the foot, the region of the tendo Achillis, the groin, the sterno-clavicular joint. Gross embolic infarction of the kidney, accompanied by severe pain, hæmaturia, and albuminuria, was, of course, well known. Less widely known, but of great importance, was the occurrence of very minute microbic embolisms in the kidney glomeruli, which was to be inferred clinically by the discovery of red blood-cells and traces of albumin in the urine of suspected or known cases. The urine should be examined systematically over a series of at least ten days, to prove or exclude this glomerular infarction. Small hæmorrhages were also frequently found in the retina.

2. *The endocarditis.*—This might be manifest or it might be masked. When evidence of endocarditis was found it must be remembered that it might be due to old-standing cicatricial changes in the valves, though it was most probably caused by the recent infection. There was, however, general agreement as to the fact that for the major part of its course subacute bacterial endocarditis was very largely destitute of cardiac features. Indeed, our conception of the disease would be in stricter accord with the facts both of clinical and of morbid anatomical observations if we did not regard it as a disease of the heart at all. In this respect it contrasted markedly with acute rheumatism.

We should therefore avoid the error of thinking a patient was necessarily free from the suspicion of infective endocarditis because his heart and pulse on critical examination showed little or no evidence of disordered function, such as arrhythmia, symptoms of inadequate response to effort, or signs of dilatation.

3. *Isolation of microbes from the blood stream.*—Since we had become more familiar with the disease the confirmatory evidence of a positive blood culture was less essential to a correct diagnosis. Sir Thomas Horder regarded a series of negative blood cultures—assuming a competent bacteriologist—as indicating some as yet unknown factor determining the content of the microbe in the circulating blood rather than as indicating that the vegetations were "bacteria-free." They must beware not to assume a better prognosis in the cases in which blood cultures were negative.

4. *Fever.*—This was probably an invariable concomitant of the disease, and its discovery was the commonest early hint that all was not well with the patient, and it was the symptom which brought most patients under observation. Though the pyrexia usually persisted, yet there were often afebrile periods, sometimes lasting for 10 or 14 days, which were often accompanied by increased tone in the patients, and presumably by remissions in the systemic part of the infective process. The afebrile periods preceding the end of the disease were but a sign that the tissue response to stimulation was at last exhausted, that an asthenic stage had arrived, and that the end was near.

In conclusion, the speaker suggested several points for discussion and elucidation, particularly the nature of the infecting organism and its possible habitat in the tonsils, periodontal membrane, and appendix; the importance of a previously damaged heart as a factor in the causation of the disease; and whether in our treatment we should do best to concentrate our attention chiefly on the streptococcus, or try still more diligently than hitherto to find a successful system of chemiotherapy, or spend our efforts largely in non-specific measures, with a view to raising the general resistance, as was the present method of dealing with pulmonary tuberculosis.

Dr. E. LIBMAN pointed out the difference between the pathological findings in rheumatic endocarditis and subacute bacterial endocarditis. In the former the vegetations were small, firm, and covered by endothelium, and in the heart muscle the Aschoff bodies were found, whereas in the latter an entirely different type of lesion was found in the heart muscle—viz., the so-called Bracht-Wachter bodies—and in the kidneys were found the almost pathognomonic focal glomerular lesion described by Lochlein and others. There were two groups of cases of bacterial endocarditis, the acute and the subacute. The acute cases were caused by hæmolytic streptococci, pneumococci, staphylococci, and other organisms. Ninety-five per cent. of the subacute cases were due to non-hæmolytic streptococci; the remainder were almost entirely due to influenza bacilli.

A pathognomonic symptom of the subacute cases was the tender cutaneous nodule, or Osler's node. Other characteristic features were petechiæ having white centres and emboli. Whereas the virus of rheumatic fever and of syphilis attacked normal valves, the infection by non-hæmolytic streptococci of subacute bacterial endocarditis occurred nearly always in valves previously damaged by rheumatic fever. A small number of these subacute cases recovered completely. Dr. Libman had seen four recoveries. About one-fourth of the cases of infection of the valves of the heart by the non-hæmolytic streptococcus recovered spontaneously from the infection without having been known to have the disease. Many cases presented a remarkable clinical picture that was formerly not understood. They had a valvular defect, and presented evidences of renal insufficiency, progressive anæmia, or embolism. Some had a very large spleen, and were mistaken for cases of Banti's disease. Others developed a remarkable dark-brown colour in the face.

There was no method of treatment of this disease that was of any value. It was therefore important to plan a campaign of prevention. All cases of valvular disease should be periodically examined for foci of infection, the teeth, tonsils, and accessory sinuses being the important avenues of entry of the bacteria. Persistent immunisation should be attempted. The importance of this plan of prevention could be realised by the fact that subacute streptococcal (and influenzal) endocarditis caused one-third of the deaths due to valvular disease, and that it attacked, in the main, young people not yet incapacitated by their cardiac inefficiency.

Dr. T. WARDROP GRIFFITH (Leeds) remarked that subacute bacterial endocarditis was characterised by symptoms which were much less mechanical than in the other varieties of endocarditis. The disease produced chemical rather than mechanical effects.

Dr. F. J. POYNTON (London) showed several slides which exhibited bacterial infection in cases of rheumatic endocarditis. In his view subacute bacterial endocarditis always occurred in persons who had originally suffered from rheumatic endocarditis, from which they had temporarily recovered only to be attacked later by microbic invasion in their damaged hearts.

Dr. CAREY F. COOMBS (Bristol) said that in rheumatic carditis the whole heart was affected, and not the valves only, whereas subacute bacterial endocarditis was a valvular lesion primarily. Syphilis was an occasional forerunner of bacterial endocarditis, and some cases could be traced to congenital anomalies; but the most frequently pre-existing disease was rheumatism, and therefore the most important factor in its prevention was the prevention of the incidence of rheumatic attacks.

Dr. A. G. GIBSON (Oxford) laid particular stress upon the search for petechial hæmorrhages and for the presence of blood in the urine as an indication of the existence of the so-called "flea-bitten kidney."

Dr. J. HAY (Liverpool) emphasised the following important clinical points :—

1. An increased tendency to a rapid action of the heart (over 100). He did not attach much importance to extra-systoles. 2. Clubbing of the fingers was quite noticeable early in the disease. 3. Malaise, together with a cardiac murmur, arrested attention and necessitated investigation. 4. Pyrexia. 5. The spleen was enlarged at an early stage.

The diagnosis could be, and ought to be, made clinically, independently of blood examination. From the point of view of prevention the rheumatic stage was the only one that mattered. Every patient who suffered from valvular disease of the heart should be thoroughly overhauled from time to time, and here they must fall back on the general practitioner, who must recognise the position of affairs and prevent the development of the disease.

Dr. A. E. GOW (London) referred to the occurrence of recurrent transient erythema involving the inner side of the calf or the trunk, which he had noticed as a symptom of the disease, and which he believed to be toxic in origin.

Dr. H. J. STARLING (Norwich) related his experience of 38 cases which had occurred among soldiers. In his opinion the chief diagnostic points were :—

1. Insidious onset. 2. Pallor, the face having a pale primrose-yellow colour. 3. Endocarditis; all his patients had valvular lesions. 4. Clubbing of the fingers; present in 76 per cent. of the cases. 5. Enlargement of the spleen; occurred in 81 per cent. 6. Petechiæ were present in 58 per cent. 7. Osler's nodes were only found in six cases. 8. Gross embolic phenomena occurring in large vessels—in 37 per cent. 9. Absence of pyrexia. Fever when it occurred was dependent on embolism.

He had particularly noticed the occurrence of the disease in a fine type of man: 11 of his patients had never suffered from any illness either before or during the war; 12 had had over three years' service in the army, and 15 over four years' service. Post mortem the vegetations found on the valves were calcareous, and in some cases he had noticed a curious condition of the aortic valves, two of the cusps being completely fused together. The spleen was found enlarged in all the autopsies except one.

The following speakers also took part in the discussion :—Dr. THOMAS LEWIS (London), who presided at this session, laid particular stress on clubbing of the fingers as a sign of the disease, and pointed out that petechial hæmorrhages occurred in the form of a ring rather than a spot, and were often situated round the clavicle; Dr. J. M. COWAN (Glasgow); Dr. G. D. LAING (Limpsfield); Dr. R. J. BUCHANAN (Liverpool); and Dr. E. P. POULTON (London) and Sir THOMAS HORDER replied to various points raised during the course of the discussion.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

WEDNESDAY, JUNE 30TH.

Professor J. LORRAIN SMITH presided, and the session opened with a discussion on

Liver Atrophy.

In the unavoidable absence of Professor STUART MCDONALD (Newcastle-on-Tyne) the discussion was opened by Dr. J. MILLER (Edinburgh) and Dr. A. RUTHERFORD (Edinburgh). From a study of their material, which included 15 unpublished cases, they were able to obtain a very complete picture of the morbid changes in the various stages of the disease.

Three types of atrophy—the acute, the subacute, and the chronic or cirrhotic—were distinguished. The latter is termed by the authors "multiple nodular hyperplasia." In the acute form there was more or less complete destruction of the liver parenchyma with a minimum of reaction. The subacute type showed vascular and inflammatory cell reaction, a proliferation of the smaller bile channels, and commencing formation of connective tissue. In multiple nodular hyperplasia regeneration was the prominent feature, the organ showing œdematous nodules of liver tissue and being small or large according to the degree and extent of regeneration. There was no hard-and-fast line between this type and so-called alcoholic cirrhosis, but the age of incidence and possibly the causation were different. Lantern slides and drawings illustrating the macroscopical and microscopical appearances of the various types were then shown. As regards ætiology there was no single cause of acute yellow atrophy. Indeed, a striking point in most of the clinical histories was the number of diseases which preceded or accompanied the liver condition. The most frequent were tuberculosis, syphilis, typhoid, influenza, and scarlet fever. In some cases a single virulent poison caused complete destruction of the liver; in others there was a series of attacks on the liver parenchyma. Death might occur at any stage of the disease, but in the chronic condition the patient was likely to survive for an indefinite period. He was, however, very liable to succumb to intercurrent infection.

Dr. B. H. SPILSBURY (London) said that on investigation of the morbid processes in the liver many conditions were found in which atrophy of the parenchyma resulted from the contraction of scar tissue formed in the course of an inflammatory or toxic process. Such conditions were alcoholic cirrhosis, chronic perihepatitis, and congenital syphilis. In acute yellow atrophy the process was essentially a toxic degeneration of the liver cells with areas of necrosis, and the patient seldom survived long enough for fibrosis to occur in the organ. Fibrosis was, however, found in the subacute form of the disease. In poisoning by T.N.T. and tetrachlorethane there was rapid necrosis of the liver cells, or, where the action was less marked, fatty degeneration which might be followed by necrosis. After a longer period fibrosis occurred with compression atrophy of the remaining liver substance. Scarring of the liver would probably be found post mortem in many cases which had recovered from T.N.T. poisoning.

Mr. A. G. R. FOULERTON (London) dealt with fatty changes in the liver and kidneys caused by various poisons both in the human subject and in experimental animals. He dwelt on the fact that with the exception of arsenic, antimony, and mercury, these poisons are all either fat solvents or are soluble in fats. He considered that the food fat, which is normally mobilised in the liver, reaches the organ combined with a large amount of the poison. The latter destroys the liver cells, which are then unable to deal with the fat. Some of the unaltered fat finds its way to the kidney, which likewise succumbs to the effect of the poison. This theory, which is confirmed by experiment, explains the widespread lesions in the liver and the nephritis which is the common accompaniment of the condition.

Dr. WILLIAM HUNTER (London) considered that the fatty changes in liver and kidney are due to cell degeneration or to the unmasking of fat previously present in the cell. In his view the poison affects every cell in the body simultaneously. If the lesion is severe enough to put the liver out of action the proteolytic ferments which it contains will digest the liver cells and cause the universal destruction which is so marked in the disease. The clinical symptoms are caused by the toxic products from the portal blood and from the liver itself escaping into the circulation.

Dr. MATTHEW J. STEWART (Leeds) spoke of the ætiology of the disease and of the morbid changes in the liver in the cases which had come under his notice. He had followed up several cases of T.N.T. poisoning with symptoms of acute yellow atrophy, which had recovered. The majority of patients were in excellent health; the only symptoms complained of in one or two instances were occasional bilious attacks and epigastric pain.

Dr. J. W. MCNEE (Glasgow) described the changes found in the liver and kidney in Weil's disease. In his experience there had not been any fatty change in the liver or kidneys, although acute nephritis was present. He thought that further work was required on liver function in normal and pathological conditions.

Dr. RUTHERFORD and Dr. MILLER replied.

THURSDAY, JULY 1ST.

Present Position of Cancer Research.

The discussion was opened by Dr. J. A. MURRAY (London), according to whom cancer research presents "a restless complication of bold hazards and miserable disappointments." The difficulties which beset the investigator are not always understood by the public, who regard with a certain impatience the detailed

nomenclature and classification of tumours. They do not understand the very rigid criteria to which a so-called cancerous growth must be subjected before its malignant nature is accepted by the research worker, especially where a so-called "cure" has been proclaimed. These criteria are still mainly clinical—e.g., the progressive character of the growth, the formation of metastases, &c. In animals successful transplantation to normal individuals of the same species is often considered the only valid proof of malignancy, though possibly the establishment of artificial metastasis by autologous grafting is a more just test.

The outstanding achievement of experimental cancer research during recent years was Jensen's discovery of acquired resistance to grafted cancer following an unsuccessful inoculation. Unfortunately, no effect is produced on spontaneous growths by this line of treatment, though, curiously enough, animals can be rendered resistant to a secondary inoculation of the same or another carcinoma without modifying in the slightest degree the progress of the established tumour. The resistant state only lasts a short time. It is accompanied by the appearance of plasma cells in the connective tissues throughout the body. According to some workers immunity is associated with an increase in circulating lymphocytes. It is found that X radiation in rats and mice produces a lymphocytosis or a lymphopenia according to dose, and the increase of lymphocytes is accompanied by increased resistance, their diminution by diminished resistance to implanted cancer. Exposure to a hot dry atmosphere, which is also accompanied by lymphocytosis, appears to prevent the development not only of homologous, but also of autologous grafts. These results, if confirmed, are extremely important, since it has hitherto been impossible to influence the growth of transplanted cancer in the same animal.

Direct attacks on the clinical and therapeutic side of the problem of cancer have so far failed in their object. Probably our knowledge of the fundamental processes of cell life is not yet sufficiently advanced for the purposes of cancer research. The problem as to why the cancer cells are uninfluenced by the forces limiting the increase of healthy or diseased tissues is still unsolved.

Dr. H. J. CAMPBELL thought that carcinoma possibly represented an attempt on the part of the organism to reproduce itself by budding. Growth takes place in organs which are undergoing regression and yet have a plentiful blood-supply. Under such circumstances cells tend to revert to the germinal type. Given a superadded local irritation and a hereditary tendency, cancer is likely to supervene.

Dr. A. LEITCH (London) said that inoculation experiments had been of very great service in clearing the ground and defining the extent of our knowledge. None of us, however, would deduce a theory of cancer from them. He touched on the difficulty of distinguishing between innocent and malignant tumours, and gave parotid tumours as an example. In animals the biological test could be performed, though it was not absolutely conclusive. A tumour might become malignant after transplantation when the original growth was innocent. Artificial resistance, which is produced by unsuccessful inoculation of tumours, is not a true biological immunity. It is not possible to immunise an animal against its own tumour. There are no serological differencies between normal and resistant mice, and none of the serum reactions devised for the detection of carcinoma in the human subject have been of any value. Future bio-chemical research may reveal differences between normal and cancerous cells; until then serological methods of diagnosis were unlikely to succeed. Treatment of cancer by radium had always interested him, but he had never seen a cure.

Dr. S. RUSS (London) referred to Murphy and Morton's experiment subjecting animals to cancer inoculation after exposure to heat. These workers also removed growths from animals, subjected them to X rays, and then reinoculated them, with the result that the tumours did not grow. The function of the lymphocyte was not exactly known, but lymphocytic activity was observed round grafts in immune animals. Nevertheless the number of circulating lymphocytes could be increased by X rays without producing immunity, so that some intermediate reaction was probably required. The difference between homologous and autologous grafts is one of degree. If a batch of animals are inoculated the tumour grows very differently in different animals. In some the growth is progressive, in others the tumour vanishes, and all stages are found between. All animals develop some resistance to grafting, but the degree varies greatly. Dr. Russ made X ray experiments on the production of immunity with the object of applying the results to man.

Dr. J. C. MOTTRAM (London) said that Dr. Murray had very shrewdly touched every important aspect of the cancer problem, but both he and Dr. Leitch took an unduly despondent view of cancer resistance. Cancerous tumours exhibit very different degrees of virulence, and certain species of animals are more susceptible to cancer than others. Heredity is an important factor. Natural resistance is sometimes very high, and, rarely, spontaneous cancer may be absorbed. Artificial resistance is increased by various means, such as grafting embryo tissues and small doses of X rays. Induced resistance, however, is never able to completely protect all normal animals. Our methods of protection are too feeble at present to have effect against spontaneous cancer.

Dr. SIMON FLEXNER (New York) said that a definite relation between lymphocytosis and tumour growth could be worked out. The lymphocytosis may be produced in various ways, but during the lymphocytic period animals are refractory to cancer inoculation. As regards the spontaneous disappearance of tumours in man, it may happen that a local tumour disappears, while metastases in other parts continue to grow. Perhaps we can think of the body being in a different state of immunity in different regions. The disappearance of a growth may be due to a local immunity.

Professor J. G. ADAMI (Liverpool) thought that cancer was due to an alteration of forces in the tissues acting on the cell from without. By appropriate stimulation cells may be induced to take on a habit of growth.

Dr. MURRAY, in reply, commented on various points brought up by different speakers. As regards the cause of cancer, he considered that we were faced with an alteration in the parenchyma of cancer cells, but our knowledge was not sufficient to elucidate its nature.

FRIDAY, JULY 2ND.

Bacteriology of Cerebro-spinal Fever.

Dr. J. A. ARKWRIGHT (London) spoke of the immense amount of work which had been done during the war. He outlined the state of our knowledge in 1914 and the problems which various workers set themselves to solve. The chief interest centres round the classification of the meningococcus. For this purpose morphological, cultural, and serological methods were available. By cultural methods different types were recognisable, but they did not always correspond to the two main groups separated by serological reactions. By methods of agglutination and absorption of agglutinins a number of subgroups could be distinguished, but there was a wide divergence of opinion as to their number and importance. Gordon's division into four types seemed too arbitrary. The serological characteristics bore no relation to the virulence of the organism. As regards carriers, he did not think their isolation was practicable in the present state of our knowledge. The best methods of preparing serum and whether it should be monovalent or polyvalent were still vexed questions. He himself would like to enter a plea for polyvalent serum.

Dr. M. H. GORDON (London) spoke on the researches and observations made in the central military laboratory for cerebro-spinal fever during the war. As regards the pathogenic components of the meningococcus, no certain evidence was found of the presence of an exotoxin, but three intracellular constituents had been identified. The first, a reducing enzyme, does not long survive the death of the coccus. The second, a hæmolytic substance, can be extracted from young cultures by alcohol or acetone. The third is the specific endotoxin of the organism and is chiefly responsible in producing the lesions of cerebro-spinal fever. According to their serological reactions meningococci can be classified into four types. In the cases examined 98 per cent. of the organisms were identified with one or other of these

strains. As a rule, only one type of organism is harboured by patient or carrier. During an epidemic the carrier rate rises considerably. The best way of preventing an outbreak of the disease is to avoid overcrowding. If overcrowding is unavoidable inhalations are effective in temporarily checking the carrier rate. The efficiency of serum treatment depends largely on the amount of anti-endotoxin the serum contains, but the manufacture of a satisfactory serum is still a matter of difficulty. Researches are now being carried out on the standardisation and preparation of antimeningococcic serum.

Dr. T. G. M. HINE (Berkhamsted) analysed 260 reports received from all over the country. These reports included clinical notes and results of treatment. Mortality before serum treatment was about 70 per cent. Mortality from 1914–18 was 60 per cent. in the civil population, but dropped to 35 per cent. in military cases. The latter were treated mainly with Gordon's monotypical serum. The mortality was definitely reduced in cases treated with serum containing anti-endotoxin against the corresponding type of organisms. Serum treatment must be instituted early and in adequate doses to be effective. A pooled serum can be used until the type of meningococcus is identified.

Dr. C. W. PONDER (Maidstone) agreed with Dr. Arkwright as to the uselessness of isolating carriers. An official opinion should be expressed on this point. He examined the bacteriology of the naso-pharynx of non-contacts among the civil population. The meningococcus was found in 41 per cent., and of these 38 per cent. gave sugar and agglutination reactions, and 26 per cent. were positive to absorption tests. These results are higher than those obtained by other workers among contacts. He thought carriers of the meningococcus were comparable to the people who carry pneumococci in their throats and whom no one would dream of isolating.

Dr. A. GARDNER ROBB (Belfast) agreed with Dr. Arkwright that polyvalent sera are of more general use than monovalent sera. Unless he had Dr. Gordon at his elbow to type the organism he would always use the polyvalent. The results with polyvalent sera were as good as those with monovalent sera when figures were carefully compared and the disadvantages and inexperience of early workers remembered. Fallacies might arise in statistics if age-periods are not taken into account. The results in infants were far worse than in people of military age. The death-rate at Belfast, taking all cases, was 27 per cent., and in military cases 12 per cent. Results, taking age-periods into consideration, were about the same in the civil as in the military population.

Dr. J. A. GLOVER (London) showed charts illustrating the effects of overcrowding on the carrier rate and on the outbreak of the disease. After about three weeks of overcrowding the carrier rate rose above 20 per cent., and cases of cerebro-spinal meningitis began to occur. Cultural meningococci are present in the naso-pharynx in normal times, but the proportion of serological types increases enormously in epidemics. As soon as overcrowding was avoided the carrier and incidence rates fell.

Dr. J. C. G. LEDINGHAM (London) spoke of his experience in the East. Detention and isolation of contacts was impracticable, but avoidance of overcrowding and general hygienic measures were effective in checking the disease. The relation of pathogenic bacteria to their homologues needed study. He did not think the use of monovalent serum was practicable.

Dr. W. E. CARNEGIE DICKSON (London) discussed the morbid anatomy of cerebro-spinal meningitis and the paths by which the organism reached the meninges. He produced specimens to show that infection of the ventricles may be earlier and more severe than that of the meninges.

Major W. J. TULLOCH (St. Andrews) answered some of the criticisms made on the work of the central laboratories. He thought too much attention had been called to exceptions in agglutination; 98 per cent. of meningococci can be agglutinated by four typical monovalent sera. Concerning absorption of agglutinins, with the employment of standard technique no difficulty is found in typing the cocci. Standard technique is of the utmost importance both in culture and agglutination experiments, and no work is of value unless the technique followed is described.

Dr. A. C. E. GRAY (London) confined his remarks to the value of antimeningococcal serum. In his experience the mortality depended on the efficiency of the serum used. Efficient treatment during the first three days really settled the issue, and this must be done with polyvalent serum. He had had no success with monovalent serum when polyvalent serum had failed. The occurrence of serum sickness varied greatly with the serum used. It was not due to differences in dose. Administration of serum should not cease with the disappearance of meningococci in the cerebro-spinal fluid, but should be continued for at least four days.

Dr. J. G. FORBES (London) described a case of meningitis caused by the *Diplococcus crassus*, and gave an account of the characteristics of the organism.

Dr. S. R. SCOTT (London) did not consider that there is any magic number of types of meningococcus. Under conditions of overcrowding there is rapid passage of the organism from one individual to another, and it acquires special virulence.

Dr. ARKWRIGHT replied to various criticisms, and regretted that time did not permit him to enter more fully into the many points of interest that had arisen during the discussion.

Dr. GORDON, in replying, said that in any effort to limit the spread of the meningococcus varying susceptibilities must be taken into account. Recruits were more susceptible than old soldiers. Prophylactic inoculation had not proved satisfactory. Monovalent sera were only undertaken as a preliminary to producing an efficient polyvalent serum.

COMBINED MEETING OF THE SECTIONS OF GYNÆCOLOGY AND ELECTRO-THERAPEUTICS.

THURSDAY, JULY 1ST.

AT a combined meeting of these sections, which took place on July 1st, Dr. A. E. BARCLAY (Manchester) took the chair. Owing to the illness of Dr. ROBERT KNOX (London) he called upon Dr. SHILLINGTON SCALES (Cambridge) to read Dr. Knox's paper.

Treatment of Uterine Fibroids.

At the commencement of his paper Dr. Knox stated that it was essential for all cases of uterine fibroids to be examined by a gynæcologist before treatment by X ray was undertaken. He illustrated the benefit of such collaboration by quoting a case in which the opinion of a gynæcologist was refused, with the result that treatment failed to give relief. Later the patient was persuaded to have a second opinion, and it was found tnat she was suffering from a mucous polypus. Pathological reports on the blood were also of great value.

At the special request of the members present full details of Dr. Knox's technique were then read. In his opinion the following were the contraindications to treatment by X rays or radium: (1) Calcareous degeneration; (2) other forms of degeneration if at all advanced; (3) coexisting malignant disease unless considered inoperable; (4) infection of the uterus; (5) pelvic inflammation; (6) inflammation of organs in the vicinity—e.g., cystitis, appendicitis, &c.; (7) submucous pedunculated fibroids. There were several disadvantages to this line of treatment, such as the long time taken to effect a result, treatment being given at intervals of several months. Moreover, treatment is not invariably successful; the tumour is often reduced in size, but does not disappear. The dangers which exist, such as burns, &c., are easily avoided if the treatment is carried out by an expert. There are, however, great advantages. The treatment is quite painless, there is no interference with the patient's routine of life, no operative shock, and rapid return to health when the hæmorrhage has been arrested. Finally, the author discussed the most suitable types of case for this form of treatment.

Dr. H. WILLIAMSON (London) pointed out the advantages of this combined meeting. Before entering upon the discussion of X ray treatment he thought it was wise to realise the very satisfactory results obtained by operation. Hysterectomy at the present time was one of the most satisfactory operations in the whole of surgery. The operation does not deprive the patient of her ovaries, a very important consideration. In his opinion X ray treatment was contra-indicated in the following ten groups of cases: (1) Where the patient is under 40 years of age; (2) where the tumours can be removed by enucleation, either from abdomen or from vagina; (3) where the fibroid shows evidence of degenerative changes; (4) where the tumour is very large; (5) where there is evidence of inflammatory lesions in the ovaries and tubes; (6) where there is any suspicion of malignancy; (7) where there are severe pressure symptoms in bladder, rectum, &c.; (8) where an ovarian cyst is also present; (9) where the fibroid is complicated by pregnancy; (10) where the patient is gravely anæmic, and the R.B.C. less than 2·5 millions. Finally he stated that the most suitable cases for this form of treatment were those over 40 years of age with a small or moderate-sized tumour, with no evidence of degeneration or malignancy, and where anæmia was not a marked symptom.

Dr. LOUISA MARTINDALE (Brighton) read a report on 118 cases of Fibromyomata treated by her since 1914. Of these, 37 cases were treated by X ray therapy alone, in 5 more hysterectomy was subsequently performed. Her choice of treatment was influenced by the size of the tumour. A very large tumour (i.e., a tumour greater than the size of a six months pregnant uterus) was a distinct contra-indication. Likewise were pedunculated or submucous fibroids. The average number of treatments was seven, but amenorrhœa was obtained after an average of four applications. In 4 cases, a further series of applications was necessary after several months. Finally, the speaker gave a very lucid and concise account of the technique she employed.

Dr. CUTHBERT LOCKYER (London) re-stated the views he had published some years ago: (1) Although acting mainly by destroying the ovaries, X rays have also a destructive influence on the cells of the myoma as evidenced by the shrinkage under treatment, which, when achieved, is too rapid to be explained by inhibited ovarian activity alone. (2) Radium and mesothorium alone are not so suitable as X rays for cases of myoma as no shrinkage of the growth can be expected. (3) X rays combined with radium and mesothorium appear to affect more rapid hæmostasis than X rays alone. (4) The French "cross-fire" combined with intensive technique promises the best results; only by "cross-fire" can topographical difficulties be overcome. (5) Treatment is of no avail in cases of submucous growths. Since then he had somewhat modified his opinion in favour of the use of radium. He did not quite agree with the treatment of young patients by this means, until the regulation of dosage was more exact.

Mr. F. L. PROVIS (London) said that the Rontgen treatment of gynæcological cases should be conducted by the gynæcologist himself. A very careful selection of cases should be made and the diagnosis be absolutely certain. The length of time taken to effect a cure has been quoted as a disadvantage of X ray treatment. This statement, critically examined, does not hold good. Compare the result with that of supravaginal hysterectomy. On an average it takes 18 months to cure by X rays, and menopausal symptoms are not severe. It is questionable whether a patient is in perfect health after a hysterectomy has been performed. Also vaginal hysterectomy induces an early menopause.

Dr. S. G. SCOTT (London) considered that satisfactory results are dependent upon two factors: (1) efficient dosage, (2) careful investigation of cases before treatment. He did not, however, think that any final judgment was at present possible: firstly, because sufficient material was not forthcoming, and secondly, because it is only since the advent of the Coolidge tube that it has been possible to give anything like consistent and effective doses.

Dr. AGNES SAVILL (London) spoke of the advisability of fewer and shorter exposures, to avoid the nausea so frequently found after this form of treatment.

Dr. W. MITCHELL (Bradford) agreed with previous speakers that in papers published on this subject dosage was very inexactly described. He considered that the question of dosage to be given in any individual case should be left to the radiologist.

Dr. SHILLINGTON SCALES agreed that our present methods of treatment were largely empirical, and that it was impossible to lay down any accepted standard as suggested by Dr. Cuthbert Lockyer, owing to the fact that the methods of each skilled worker, whilst arriving at the same result, differed so considerably in detail both as to dosage and filtration. No worker skilled in this form of treatment would consent to carry out unquestioningly a prescription of dosage and technique ordered by a physician or even a gynæcologist whose experience in this respect was not so great as his own. For a gynæcologist of equal practical experience would probably prefer to carry out the treatment himself, and Dr. Cuthbert Lockyer's disclaimer of the necessary knowledge would indicate that this would not often be the case. He was glad Dr. Williamson considered that adverse developments following upon X ray treatment were not necessarily caused by it, and he himself thought that operative treatment was followed by even more frequent ill-results. Our knowledge of the biological effect of X rays was still far from exact, and our methods and apparatus so subject to change and advance that standardisation of our technique was at present impossible.

SECTION OF PHYSIOLOGY AND PHARMACOLOGY.

WEDNESDAY, JUNE 30TH.

Meetings of this section took place on June 30th, July 1st, and July 2nd. On the first of these dates a discussion on

Acidosis in Disease

was opened by Professor F. GOWLAND HOPKINS, F.R.S., the President of the section. Professor Hopkins first emphasised the need for the removal of the ambiguity which is associated with the use of the term "acidosis." He then went on to describe the regulation of the reaction of the tissues, pointing out that the blood constitutes a kind of mechanism for the coarse adjustment of the concentration of hydrogen ions, the more exact regulation being brought about by the kidneys and respiratory centre. The disturbance of reaction produced by exposure to anoxæmic conditions as described by Haldane and his co-workers, and the appropriateness of the term "alkalosis" to the description of the symptoms was discussed. Professor Hopkins concluded his speech by referring to the riddle presented by the production of the acetone bodies when carbohydrate metabolism is arrested or disturbed.

Professor W. M. BAYLISS, F.R.S., suggested that there was little use for the word "acidosis" in the sense of an actual increase of concentration of hydrogen ions, as such an effect was rarely produced in life. The symptoms of reduced alkali reserve were probably not due to excess of hydrogen ions. The speaker quoted experiments which showed that the plasma proteins took no part in the regulation of the reaction of the blood.

Further emphasis was placed on the desirability for a clearer definition and application of the nomenclature by Dr. H. H. DALE, F.R.S.

Professor T. H. MILROY pointed out that the acetone bodies were very strong acids, and in this way accounted for the marked fall of alkali reserve in conditions of ketosis. He discussed the increased output of ammonia and the utilisation of alkali administered by the mouth in these conditions.

Dr. E. P. POULTON pointed out a source of fallacy in Van Slyke's method for estimating the alkali reserve of blood on account of the variation of the carbon-dioxide combining power of the plasma with the carbon-dioxide content of the blood from which it was separated. He then referred to a number of cases in which the actual reaction of the blood had been measured directly,

and pointed out the divergence between the results of direct and indirect estimations of reaction.

Mr. T. R. PARSONS gave an account of the reaction-regulating mechanism of the normal blood. He pointed out that the "buffer" value of blood was greater than that of solutions of sodium bicarbonate, and ascribed the difference to the properties of hæmoglobin.

Dr. P. J. CAMMIDGE mentioned experiments which suggested that the state of the liver played an important part in ketosis, and hoped that in any new nomenclature care would be taken to establish terms which would be useful in describing the results of future developments of our knowledge.

Dr. MACKENZIE WALLIS emphasised the importance of renal function. He regarded diabetic coma as being produced by a sudden retention of acetone bodies rather than by a sudden increase in the amount of their production. He regarded the pancreas as the seat of formation of a catalyst necessary for the formation of ethereal sulphates, since, in the absence of pancreatic juice entering the intestine, there was little or no ethereal sulphate in the urine.

Dr. W. D. WILKINS called attention to the fact that ketosis was associated with acute mental disease in a large proportion of cases. There seemed to be a relation between the presence of acetonæmia and mental symptoms, since mental disturbances were prominent in uræmia and diabetic coma.

Dr. E. GRACE SHERWOOD gave an account of the occurrence of acetonuria in children suffering from infective disorders.

Mr. S. W. COLE detailed his experiences in the treatment of post-operative ketosis by the administration of glucose and pancreatin. Discussing the ketosis of pregnancy associated with vomiting, he mentioned that it seemed to be due in many cases to a defective action of the pancreas, and in certain cases at least was amenable to the same treatment.

Dr. A. F. MARTIN asked whether there was any connexion between the action of bacterial toxins and the production of acetone bodies.

In concluding the discussion Professor HOPKINS emphasised the value of carefully collected data from clinical experience in the investigation of the cause of the disorder of the metabolism of carbohydrates which led to the production of the acetone bodies.

THURSDAY, JULY 1ST.

Professor J. N. LANGLEY, F.R.S., opened a discussion on the

Treatment of Denervated Muscle and the "Disuse" Theory.

Professor Langley proceeded to point out that the "disuse" theory of muscular atrophy after nerve section, according to which the degeneration of the muscular tissue is directly caused by inactivity, still remains the dominant one. The method adopted for the treatment of cases of muscular denervation will depend upon the theory held as to the nature and causes of the symptoms observed. In order to investigate the effects of the recognised forms of treatment—electrical stimulation, passive movement, and massage—he had carried out experiments on rabbits in which the sciatic nerve had been cut on both sides and the degenerated muscles on one side were subjected to treatment, while those on the other served as a standard. The criterion used for determining the condition of the muscles was their comparative weight. It was found that three weeks' treatment, either by electrical stimulation with condenser shocks or by passive movement or by massage, produced no very decided beneficial effect in delaying or in reducing the extent of the muscular degeneration. Professor Langley also referred to the similar experiments of Hartman, Blatz, and Kilborn, in which the capability of performing work was used as an extra criterion of the condition of the muscle, and in which the periods of treatment were much longer, but which led their authors to the same conclusion. In view of the doubt that these methods of treatment directly benefit the denervated muscle, it was suggested that the beneficial effects claimed by clinicians were due to the incidental circumstances involved in the treatment—namely, care in diet, a general hopeful disposition of the patient, and suitable safeguards against further injury. The condition of the nerve cells during regeneration of their axons was another important factor in the recovery, as suitable stimulation was known to produce a more rapid regeneration of the severed nerve fibres. In conclusion, Professor Langley pointed out that the most cogent argument against the commonly accepted "disuse" theory was the observation that a denervated muscle was in a state, not of rest, but of perpetual rhythmic fibrillar contraction.

Dr. E. P. CUMBERBATCH said that the conclusion that electricity is of little or no value in the treatment of denervated muscle was opposed to the opinions of those who had had long experience in the electrical treatment of paralysis. He described a case of infantile paralysis of both lower limbs in which a considerable return of voluntary power resulted from treatment with the sinusoidal alternating current. This does not produce muscular contractions, but probably acts by stimulation of the severed neurones by afferent impulses from the skin. After voluntary power is regained currents which cause contraction may be used provided their application is not carried to the point of producing fatigue. The speaker also referred to the need for maintaining a proper temperature in the treated muscles, as cold greatly retards recovery.

Dr. W. J. TURRELL pointed out that Professor Langley's experiments applied to the period of three weeks immediately following the nerve section, which is a period concerning which electro-therapists have little experience, as electrical treatment is usually begun at a later stage. It is only after nerve irritation has ceased that electrical stimulation should be applied. The requisite warmth of the affected part can often be suitably maintained by means of the galvanic current.

Dr. F. HERNAMAN-JOHNSON recommended the use of the faradic current for the production of long-continued contractions in a muscle in which voluntary power is beginning to return. He pointed out the need for avoiding fatigue in this method of treatment.

Dr. E. D. ADRIAN proposed that if electricity merely acts as a suggestive remedy it might be replaced by something simpler, cheaper, and more impressive; but he considered that electricity does produce direct effects. The general view is that electrical treatment usually results in at least a certain amount of contraction, and this might be of benefit in freeing the muscular fibres from adhesions produced by the overgrowth of connective tissue, the muscle thereby being kept in good mechanical condition.

Dr. NOEL BURKE would have expected that the treatment applied by Professor Langley during the first three weeks of degeneration would have been positively harmful. Nothing can be done to prevent the initial degeneration of the muscle after section of its nerve. In these early stages a non-contracting current is indicated which acts by producing chemical and reflex effects. It is only in the recovery stages that contracting currents should be used together with re-educative treatment.

Dr. FF. ROBERTS called attention to the danger of overstretching a denervated muscle. He had observed that among the denervated leg muscles of the rabbit those which were stretched in the normal position of the limb suffered the greater amount of degeneration. This factor may enter into Professor Langley's experiments, as the beneficial effects of the contractions in some muscles might be counteracted by the stretching to which they were submitted when their antagonists were stimulated. He regarded the psychological effect of electrical treatment as being very great.

Professor LANGLEY, in replying, maintained that there was no break in the series of changes occurring in a denervated muscle from the second day up to a year. The fibrillation gradually dies out as the atrophy sets in.

FRIDAY, JULY 2ND.

Professor W. E. DIXON, F.R.S., opened a discussion on

Quinine and its Related Alkaloids in Pharmacology and Therapeutics.

Professor Dixon briefly referred to the chemistry of quinine and pointed out the relationships between

hydroquinine, hydrocupreine, euquinine, cinchonine, and similar derivatives to the mother substance. He then explained that the characteristic action of quinine on living tissues consisted in a reduction of general metabolism, and illustrated the relative strengths of the quinine derivatives in this respect by their action on protozoa and on bacteria, and by their efficacy in producing paralysis of sensory nerve-endings in the cornea. The striking feature of the quinine derivatives was the relatively small concentration necessary to produce marked effects.

Professor W. RAMSDEN recounted experiments showing that the concentration of quinine in red corpuscles is about one-third of that in the surrounding serum. The ratio of concentration of quinine in urine to that in the blood may rise to a value of about 200, but this secretory activity of the kidney seems not to involve any damage to the organ, as it is unaccompanied by albuminuria.

Major H. W. ACTON related the experience he had had with cinchona alkaloids other than quinine in the treatment of malaria. Both cinchonidine and quinidine gave results of value.

Sir ARCHIBALD GARROD discussed the relation of quinine to the onset of blackwater fever, and while he believed that in certain cases the drug was a contributory factor, in many others the disorder seems to have been induced by exposure to cold or by active violent muscular exertion.

Dr. T. S. HELE recorded his experiments on the rate of excretion of quinine in the normal subject and in patients suffering from blackwater fever. He found that they were markedly different provided a sufficient volume of urine was produced. He drew a comparison between the excretion of quinine and that of ethereal sulphate which followed the administration of poisonous ring compounds to animals.

Lieutenant-Colonel Sir LEONARD ROGERS recommended the treatment of severe cases by intravenous injection of quinine and of others by intramuscular injection of cinchonine acid hydrochloride.

Dr. M. NIERENSTEIN suggested that blackwater fever might be produced by a substance—hæmoquinic acid—which is formed from quinine in the body. This acid is known to have hæmolytic properties.

Dr. J. C. MCWALTER stated that the treatment and prophylaxis of malaria by quinine had been a complete failure.

Dr. C. M. WENYON said that very little new knowledge on the subject of quinine administration had been obtained during the war. The mode of action of quinine was very uncertain, but useful light might be shed on the problem if the plasmodial infection in birds were further studied. It would be useful to know the reason why quinine produces so little effect in this case.

Professor J. A. GUNN had experimented with the alkaloids harmaline and harmine, and had obtained encouraging results in cases of relapsing malaria.

Dr. DALE pointed out that the lack of action of quinine in the case of avian malaria might be due to some influence of the host. He had proved that the same strain of *Entamœba histolytica* was susceptible to the action of emetine in the human subject, but not when transferred to a kitten. He further remarked that if the total alkaloids of cinchona were to be utilised this would have a very profound influence on the present policy of cinchona planting.

Colonel R. MCCARRISON suggested that in cases where the blood pressure was dangerously low this could be counteracted by the injection of adrenalin together with the alkaloid.

Dr. A. G. BODMAN recommended the injection of saline solution as well as the alkaloid in order to assist in bringing the drug into effective contact with the parasites in blocked capillaries.

In replying, Professor DIXON mentioned the harmful effects resulting from the intramuscular injection of strong solutions of quinine.

Demonstrations.

On the afternoon of Friday, July 2nd, the following demonstrations were given in the Physiological Laboratory.

Dr. C. SHEARER: The heat evolved during the growth of bacteria. The cultures were grown in Dewar flasks and changes in temperature measured thermo-electrically.

Mrs. E. W. PARSONS: Constant temperature centrifuge (used in the study of gaseous equilibria in blood) and large centrifuge.

Mrs. D. THACKER and Dr. E. D. ADRIAN: Capillary electro-meter recording the electrical variations in the frog's heart, and other electrical measurements.

Mr. W. HARTREE: Thermopiles for the registration of very small changes of temperature, particularly those occurring in muscular contractions.

Mr. W. M. COLEMAN: The voluntary control of the pulse-rate.

Mr. T. R. PARSONS: Apparatus for determining the hydrogen-ion concentration of blood and other body fluids by the electrometric method.

Dr. E. J. COHN: The preparation of solutions of pure hæmoglobin by dialysis at 0° C.

Dr. H. HARTRIDGE: (1) Colourless safe light for photography; (2) the estimation of carbon monoxide in blood; (3) methods for microscopic illumination.

Mr. G. S. ADAIR: Osmometers. The determination of the osmotic pressure of hæmoglobin.

Mr. J. E. BARCROFT: Air-tight glass room for experiments on respiration.

Dr. FF. ROBERTS and Dr. E. P. POULTON: Apparatus used in determining the dissociation curve of blood, and in obtaining and analysing alveolar air.

Professor LANGLEY: The fibrillation of denervated muscle (to illustrate his opening speech of the morning). Slides showing the absence of central degeneration in nerves tied so as to divide the axis cylinders and medulla, but not the neurilemmal sheaths.

Professor C. A. LOVAT EVANS and Dr. H. H. DALE: A dialysis-indicator method for determining the hydrogen-ion concentration of blood.

Dr. F. H. A. MARSHALL and Mr. J. HAMMOND: Histological preparations and dissections illustrating points in the physiology of reproduction.

Dr. T. LEWIS and Dr. FEIL: An auricular myograph.

Professor and Mrs. E. MELLANBY: Accessory food factors. Dogs exhibiting the effects of deficient diets were shown, and also histological specimens and X ray photographs.

SECTION OF TROPICAL MEDICINE.

WEDNESDAY, JUNE 30TH.

Problems of Filariasis.

This section opened on June 30th, with Professor G. H. F. NUTTALL, M.D., F.R.S., as President, when

Professor J. W. W. STEPHENS read a paper on the Problems of Filariasis, in which he drew attention to the conflicting statements as to the relationship of *Filaria bancrofti* to lymphatic diseases and the erroneous conclusions drawn from the failure to discover microfilariæ in the blood of cases of elephantiasis—a failure due to the death of the adult filaria previous to or following on the stage of the development of elephantiasis. He exhibited tables of figures giving the proportion of population examined and the percentage of those examined and found to be infected by microfilariæ in Amoy (China) by Manson in 1883, in Fiji by Manson-Bahr in 1912, and in Cochin China by Cruickshank and Wright in 1914, and in the case of Manson-Bahr's statistics (see table) the age-periods concerned.

	Population examined.	Percentage infected.		Population examined.	Percentage infected.
0–10	72	1·4	41–50	83	45·7
10–20	222	15·7	51–60	58	44·8
21–30	212	37·7	61–70	39	41·0
31–40	118	47·5			

Tables were also displayed, giving the microfilarial rate among the natives of Fiji and Cochin China in two groups: (1) those showing signs of lymphatic disease; (2) those without evidence of such condition. Manson's data derived from natives of Amoy (China), 1883, agreed with those of Manson-Bahr for Fiji (1912), in that these observers found that the microfilarial rate was greater in group (1) than in group (2), although Manson's data derived from specimens at a later date (1907) than his

original observations and the results obtained by Cruickshank proved to be directly opposite. Microfilarial rates were also compared among those suffering from elephantiasis and those not so suffering; observations of Manson in 1883 and Tribondeau showed that those infected with microfilariæ were more numerous among the elephantiasis than among the non-elephantiasis group, whereas Manson's later figures (1907) and Cruickshank's (1914) from Cochin China showed the reverse to be the case. Comparisons of infection by microfilaria, elephantiasis and lymphatic abscess rates were further provided by tables, and also of the varying rate of infection in different countries. Manson-Bahr in Fiji (1912) found 27·1 per cent., Cruickshank in Cochin China (1914) 20·9 per cent. of population infected. Furthermore, enlargement of lymphatic trunks proved to be nearly ten times as common in Fiji as in Cochin China, and of the lymphatic glands twice as common in Fiji as in Cochin China. Results of the work of various observers seemed to show that the region of the body affected by elephantiasis varied according to the particular country, and much investigation was required to explain this peculiarity.

Dr. P. MANSON-BAHR then read a joint paper by Dr. G. C. LOW and himself on

The Rôle of Filaria bancrofti *in the Production of Lymphatic Obstruction, and a Consideration of Elephantiasis from the Pathological Standpoint,*

in which he discussed the discrepancies of different observers. He attributed them partly to the want of standardisation of methods adopted in securing specimens of blood—a personal factor, and partly to the uncertainty of clinical details as to what constituted glandular enlargement, and the standard of enlargement to be recognised as due to filarial disease, particularly as it was the exception to find the native, accustomed to going about barefoot, and therefore readily subject to septic infection, without slight degrees of glandular enlargement. The question of degree of enlargement involving the lymphatic trunk and what should be regarded as a thickened condition due to filarial infection was one requiring definition. *Filaria bancrofti*, he maintained, had a different habitat in the body which varied according to geographical distribution; in China and India the adult worm inhabited the lymphatic trunks, whereas in the Pacific the lymphatic glands, and especially the epitrochlear gland, were the most usual seat. A further important feature affecting different observers' results and favouring the possibility of erroneous conclusions was to be found in the fact that in the East microfilariæ were nocturnal in their appearance, but in the Pacific they were quite irregular in their periodicity. The degree of pathogenicity of *F. bancrofti* was governed by three fundamental factors. (1) Zoological, according to whether there were dead or living filariæ in the lymphatic glands or trunks, the dead acting as a mechanical irritant. Provided embryos could get free passage through the lymphatic vessels they caused no obstructive disturbance and were, therefore, not pathogenic, and their host might remain in perfect health for some considerable time and only at a later date show evidence of lymphatic obstruction. (2) Pathological. With the presence of *F. bancrofti* in a lymph channel, narrowing of the lumen of the vessel might develop as the result of proliferation of the lining endothelium, and subsequent occlusion be produced. This resulted in obstruction to the free passage of microfilariæ along the lymph vessels to the glands, especially those distal to the obstruction. They laid stress in particular on fibrosis of the lymphatic glands as a pathological feature to which little attention had been drawn, a change accompanied by giant cell formation and eosinophil production, and probably due to helminthic toxins causing inflammatory disturbances, which may be widely scattered and generalised in their effects on the glands. As a result of obstruction to the lymph channels with lymphangitis and consequent lymph stasis, the embryos were unable to survive for long in the stagnant lymph stream and would consequently disappear from the blood circulation, the dead microfilariæ being found only in the lymph capillaries and glands. The parasitic cause became defunct but its obstructive effect remained, and after repeated infestation resulted in the gradual development of elephantiasis. In the diagnosis of tropical elephantiasis the importance of the disappearance of the microfilariæ from the blood-stream required to be borne in mind, as well as the possibility of elephantoid conditions arising from such other causes as septic lymphangitis, from the absorption of irritant poisons, as in a case quoted due to the effect of chrysarobin; also as the result of lymphatic fibrosis following on such infections as spirochætosis.

They emphasised the unreliability of statistics from different sources, the anomalies of which, due to the various factors already mentioned, could be explained and corrected by the proper study of the pathology of the disease. He summarised such study as proving, firstly, that *F. bancrofti* was a parasite of, as elephantiasis was a disease of, tropical and subtropical countries; secondly, that the maximum rate of microfilarial infestation corresponded with that of elephantiasis; thirdly, that the filarial disease rate was double that of the concomitant microfilarial invasion of the blood, and consequently the embryo rate could not be regarded as a true measure of the blood infection in any particular population.

Major E. BLACK introduced his remarks with a reference to his unique experience and early association with the work of Bancroft himself. He agreed with Dr. Manson-Bahr as to the unreliability of statistics bearing on microfilarial blood infection in that microfilariæ might be found in the glands when not in the blood, and therefore their absence from the blood-stream was no measure of the degree of infection. He also pointed out that in Brazil and Western Australia microfilariæ could be found in the blood of almost every person examined without there being any evidence of impaired health, elephantiasis, or enlargement of the glands, and that many of the cases originally examined by Bancroft 40 years ago, and found to be infected, still remained in good health. The state of our knowledge of filariasis was at present far from complete, and explanations were needed as to the night rises of temperature which might possibly be attributed to the presence of microfilariæ in large numbers in the blood. He conjectured that the solution of the problem of toxicity might yet be found and differentiated on the same lines as the dependence of bacteria for their toxicity on the protein of their cell bodies, and that so the toxicity of filariæ might vary according to the composition of their particular proteins. The susceptibility of monkeys to filariasis might also assist in providing a solution.

Discussion.

Surgeon-Captain P. W. BASSETT-SMITH, R.N., considered that much depended on the technique of work employed and on the clinical and pathological conditions in the provision of reliable data. Absence of the effects of a prevalence of microfilariæ in the blood formed a curious feature of filarial disease. A degree of eosinophilia ranging from 50 to 20 per cent. pointed to toxic influences. The presence of microfilariæ in the blood was very little affected by intravenous remedies of arsenic or antimony, which did not appear to exert any influence on the amount of infection. The inoculation of rabbits and guinea-pigs with microfilariæ so far had shown no ill-effects.

Dr. D. E. ANDERSON suggested that the rise of temperature might be due to the quantity of food causing greater activity of filariæ in the evening. In regard to the prevalence of elephantiasis, he thought the number of cases found in St. Kitts and Madagascar was much less than expected.

General P. HEHIR, A.M.S., alluded to the location of filariæ in the generative system and bladder as being common in Calcutta, and, with reference to chyluria, mentioned the first discovery of microfilariæ in the urine by Timothy Lewis in 1871.

Dr. W. F. LAW, quoting from 25 years' experience in British Guiana, had never seen any marked epitrochlear gland enlargement, and referred to the work of Dr. Wise,

who associated the death of the parent worm with lymphangitis due particularly to streptococcal infection.

Dr. B. SPEARMAN asked if Dr. Manson-Bahr had experienced a heavier incidence of filarial disease in men than women. His experience in Uganda had shown that out of a total of 10–20 per cent. infection of the whole of the native population all had been men, and that the disease was very rare in women. He had never found any epitrochlear gland enlargement, or elephantiasis of the upper extremity, breast, or arm.

In replying to various points raised in the discussion, the opener, Professor STEPHENS, observed that the object of his paper was not so much to bring forward the relationship of *F. bancrofti* to filarial disease as to put on record facts already known, and to draw attention to discrepancies which occurred among these records.

Dr. MANSON-BAHR claimed that the investigation of filarial disease should include a complete survey of all tropical countries. There were many statistics available which were the result of anything but exact observation and reliable material. A close observance of accurate and systematic technique was essential, and a new basis of work was much needed to get rid of erroneous results. Among natives it was impossible to attain to anything like accuracy as to the age-periods, and his tables of the age incidence of filariasis were purely approximate. In Fiji he found that more men than women were infected, due, no doubt, to the different habits of the two sexes, the former working in the fields and therefore more exposed to infection conveyed by the bites of mosquitoes, while the women stayed at home.

In blood-cell changes in filariasis he included polymorphocytosis and eosinophilia, but he did not pay too much attention to the latter, as in Fiji as much as 13 per cent. eosinophilia was very common among the majority of natives. Enlargement of the epitrochlear gland was also common in the Pacific Islands, due largely to the fact that the carrier of infection, *S. pseudoscutellaris*, in Fiji shelters among the yam plantations and bites during the day, attacking chiefly the exposed hands of the men labourers. Consequently the *F. bancrofti* would be found to vary its habitat, and similarly the distribution of elephantiasis in the body would vary according to the habits of the natives and the particular mosquito acting as carrier of the filarial infection. In other parts of the world, culex was the carrier, and, biting at night, infected other parts of the body, especially the legs, rather than the arms.

Dr. LOW, also replying, emphasised the importance of obtaining measured quantities of blood and at stated periods, for securing an accurate estimate of the microfilarial rate. Cases of elephantiasis, chyluria, and lymphangitis seldom showed microfilariæ in the blood, from the fact, especially in elephantiasis, that the *F. bancrofti* was long dead. For the embryo-rate two classes had to be considered, those with filarial disease and those without filarial disease. He regarded the great difficulties of work at night as providing possible sources of error. To obtain a correct estimate of the local rate of infection it was important to examine only indigenous natives and to avoid inclusion of those who had migrated from other parts. Unless such migration from uninfected areas was discounted, it would lead to considerable inaccuracies when attempting to arrive at reliable conclusions based on the blood examinations of natives in any given locality. In Grenada he was told there was no filarial disease, and in examining for the embryo-rate, out of 400 natives not one showed microfilariæ. Dr. Kocher had examined as many as 2000 without finding any embryos. In Barbados there was more evidence of infection. In St. Kitts, where there was an enormous degree of filarial disease, the microfilarial rate was 30 per cent. The rate of infection varied much with evidence of filarial disease, as in the case of elephantiasis already mentioned, the absence of microfilariæ from the blood was due to the death of the parent worm long previously.

With reference to the pathogenicity of the filaria, Dr. Low gave instances of the presence of microfilariæ in the blood, followed possibly in five years by the development of elephantiasis, with a disappearance of embryos from the circulation. Fresh re-infection would account for the appearance of microfilariæ in the blood of some cases of elephantiasis. He was well acquainted with the valuable work of Dr. Wise in British Guiana, and remarked on the association between filarial abscesses and the death of the parent worm, which might be due to coccal infection resulting in septic lymphangitis and septicæmia. There was possibly a racial susceptibility to filarial infection in British Guiana, and he regarded the Portuguese and Barbados negroes as more liable to infection than the pure white European, who, however, might, after long residence, become infected. This was probably rather a question of antifilarial prophylaxis, protection by the use of mosquito-nets.

During the course of the afternoon demonstrations Dr. MANSON-BAHR, in illustration of his paper, exhibited a number of interesting microscopical slides showing the pathological changes of filarial disease—e.g., obstruction to the lymphatic vessels, glandular fibrosis, and calcification of the filaria.

Lieutenant-Colonel R. MCCARRISON, I.M.S., read a paper on

Dietetic Deficiency and Endocrine Activity, with Special Reference to Deficiency Œdemas,

in which he described the results of experiments on pigeons, guinea-pigs, and monkeys, produced by feeding these animals on six classes of deficient dietaries: (1) deficient in all three classes of vitamines and in suitable protein, but rich in carbohydrates; (2) deficient in B and C vitamines, and rich in carbohydrates and fats; (3) deficient in B vitamine, but rich in carbohydrates and fats; (4) deficient in A and B vitamines; (5) B vitamine only lacking; (6) C vitamine deficient. He attributed the effects of these dietaries on the endocrine organs to the action in varying combination of, firstly, deficiency of vitamines; secondly, imperfect balance of the proximate principles of the food; and thirdly, the chance occurrence of pathogenic agents in the body. As the result of dietetic deficiencies, all endocrine organs except the adrenals and pituitary body, which underwent enlargement, suffered varying degrees of atrophy and lowering in functional capacity. Colonel McCarrison described the alteration which took place, following on the use of the various deficient diets in the different animals experimented on, and displayed diagrammatic charts showing the relative changes produced in the endocrine organs, the thyroid and parathyroid glands, the gonads, the pancreas, thymus, spleen, pituitary body, and adrenal glands.

The effects, such as atrophy and hæmorrhagic enlargement, differed according to the species of animal, the character of the deficient diet, and the particular organ, not all the animals responding in the same degree when fed on the same diet. The adrenal glands, the most susceptible of all the endocrine organs to dietetic defects, were found to become enlarged as the result of all six classes of deficient dietaries and also in consequence of starvation. But the character of the enlargement varied according to the class of diet, both histologically and as regards adrenalin content—e.g., a scorbutic diet in guinea-pigs produced hæmorrhagic infiltration of the cortex, associated with a great reduction of the adrenalin content, whereas in pigeons autoclaved rice and butter gave rise to marked hæmorrhagic infiltration of the medulla and, as a rule, a low adrenalin content. With food deficient in vitamines and suitable protein and rich in carbohydrate, but well balanced with regard to proximate principles, the enlargement of the adrenals was less marked and the adrenalin content lower than when this balance was wanting, in the case of pigeons and monkeys. The quality of the food, therefore, governed the amount of adrenalin content, as also did concurrent infections. Œdema, usually hydropericardium, was often associated with enlargement of the adrenals, but did not occur in the absence of a corresponding increase of adrenalin content. It was found that the addition of fresh butter to a dietary of autoclaved rice lowered the incidence of œdema in pigeons, and appeared to afford complete protection up

to the thirty-sixth day of the experiment, after which, however, the butter gave no protection against the occurrence of *wet* polyneuritis, although some of the pigeons, 19 out of 29, had already developed *dry* polyneuritis.

The lowered incidence of œdema was associated with a lowered adrenalin content, yet an increase in weight of the glands occurred. The limitation of protection against wet polyneuritis to 36 days was attributed to the development of pathological changes in the digestive organs resulting from deficient dietaries and possibly from an inhibition of the assimilation of substances on which protection against œdema was dependent. Butter was also found to vary in its capacity to protect against œdema in pigeons fed on autoclaved rice, due probably to a difference in the lipochrome content of the butter, according to the particular fodder on which the cows providing the milk for the butter were fed. It was therefore suggested that the hypothetical "anti-œdema" substance might be of the nature of lipochromes.

Summarising the chief points of the results of his experiments Colonel McCarrison again drew attention to the changes in the adrenals, the character of whose enlargement varied with that of the dietetic deficiency. The adrenalin content also varied according to the diet, being in excess when food was deficient in vitamines and protein but rich in starch, below normal when the diet was scorbutic and when concurrent infections were associated with dietetic defects. He pointed out the important bearing of his observations on the causation of deficiency œdemas in the human subject. He regarded it as probable that interference with the normal excretion of urine by an excess of adrenalin reaching the kidneys favoured the retention of fluid in the tissues. As pointing in this direction he quoted human beri-beri with its associated adrenal enlargement and high adrenalin content and small output of urine, and alluded to the inhibition of the urinary flow by intravenous injection of an excess of adrenalin and the retention of NaCl caused thereby in the tissues. He maintained that as a channel of communication had been shown to exist between the kidneys and adrenals, the product of the glands might reach the kidneys without alteration in the general circulation, and thus control the excretion of urine. There followed, in consequence, the important fact that adrenalin was, in its turn, controlled by the quality of the food.

Additional factors doubtless played a part in the causation of œdema, such as impaired endothelial function, changes in vascular permeability, impaired metabolism of proteins and lipoids, and chemical changes in the tissues—all attributable to disturbed endocrine function and altered metabolism following on deprivation of vitamines and malnutrition.

In reply to points raised in the discussion which followed, by Dr. ANDERSON, Surgeon-Captain BASSETT-SMITH, Dr. LOW, Dr. MANSON-BAHR, and General HEHIR, Colonel McCARRISON said that it was not known what particular deficiency of diet caused such specific effect as enlargement of the adrenals. He considered that the fatty degeneration of the adrenal cortex accounted for alterations in adrenalin content, but it was not known whether the cortical changes were toxic in origin. As regarded the condition of the liver following on use of deficient dietaries there was no great amount of atrophy measurable by alteration in weight; histologically there was congestion of the hepatic capillaries and degeneration of the liver cells. Depression of cellular function was the foundation of diseases of dietetic deficiency.

With reference to the causation of war œdema he was of opinion that its production was due to the mixed effect of a dietetic deficiency of vitamines and lack of protein, assisted probably by pathogenic agencies within the body. As to the influence of extra work in the presence of dietetic deficiency, he had found that the most active animals suffered earliest—as in the case of pigeons with polyneuritis—and so with dogs, who developed rickets earlier than other less active animals. He attributed this early response to the greater call on metabolism brought about by greater muscular activity

There was an exhibition of specimens in illustration of Colonel McCarrison's paper in the Pathological Museum.

Stibenyl in the Treatment of Trypanosomiasis.

Dr. MANSON-BAHR read the paper on his recent experiences with intravenous injection of stibenyl (acetyl-p-amino-phenyl stibiate of sodium) in the treatment of trypanosomiasis and kala-azar, which appears in our original columns.

Dr. ANDREW BALFOUR referred to the race for favour between emetine and antimony in the treatment of tropical disease, and sought information as to how antimony acted, whether the beneficial results were due to a direct parasiticidal or a more general action.

Colonel S. L. CUMMINS, A.M.S., alluded to the effect of antimony on pathogenic yeast, and inquired as to the possibility of its action directly on the organisms or on the tissues surrounding them.

Dr. MANSON-BAHR, in his reply, stated that emetine was not poisonous to *Entamœba histolytica* outside the body and that its beneficial action in tropical abscess might be attributed possibly to the effusion of serum which occurred into the abscess cavity, and thus killed the entamœba. He thought it probable that antimony compounds varied in their action according to the particular parasite, and that each kind of parasite required a special antimony preparation, as instanced in the case of bilharziasis, which responded to antimony tartrate, but not to stibenyl, whereas in trypanosomiasis antimony tartrate was badly tolerated and stibenyl promised excellent results.

Demonstrations.

The Section provided demonstrations during the afternoon sessions of June 30th and July 1st, which included—

1. Parasitic Worms, by Dr. R. T. LEIPER.
2. Exhibition of all known species of Tsetse Flies, including a consideration of their morphology and bionomics, by Professor R. NEWSTEAD.
3. Paintings illustrating the treatment of Leprosy by Chaulmoogra Oil, Soya Bean, Sodium Gynocardate, and Sodium Morrhuate, and the striking effect of the latter two drugs, by Sir LEONARD ROGERS.
4. The treatment of Bilharziasis by Intravenous Injections of Antimony Tartrate, by Dr. J. B. CHRISTOPHERSON. Two points were emphasised: (1) That antimony (pot.) tartrate given intravenously (*a*) kills the adult bilharzia worms, (*b*) kills and sterilises and arrests the ova which the worms have deposited, by killing the myracidium within the ovum; (2) that the operation of intravenous injection of antimony tartrate is a simple one, and is capable of being carried out as out-patient procedure on a large scale.
5. Microscopic slides illustrating Elephantiasis, and showing the histological changes in filarial obstruction of the lymphatic vessels, dead and calcified specimens of *F. bancrofti*, by Dr. MANSON-BAHR.
6. Malignant Malaria, by Dr. J. F. GASKELL, including preserved brain sections from a case of cerebral malaria which showed extensive punctate hæmorrhages; also microscopical slides and drawings of heart muscle and spleen showing degenerative changes and fibrous tissue-formation respectively, and in them the suggested nidus of the resting parasite. Slides and drawings were also exhibited of the development of the male and female crescents, and of the phases of the ring, schizont, and rosette formation coexisting in the same case, together with clinical details of a fatal case terminating suddenly from acute toxic effects, and of proportional counts of the number of parasites in the circulation per c.mm. exhibiting a fall coincident with intravenous administration of quinine.
7. Early stages in the life-history of *Ascaris lumbricoides* were demonstrated by Colonel F. H. STEWART, I.M.S., who explained the migration of the larva from the bowel via the portal circulation into the liver, thence by the venous circulation to the right heart, eventually through the pulmonary capillaries to reach the pulmonary alveoli and to regain the alimentary tract by way of the bronchial passages, trachea, pharynx, and œsophagus—a cycle

of events occupying a period of about ten days—at the expiration of which the larvæ appeared in the fæces. Microscopical sections were shown displaying the larvæ and the changes produced by them in the pulmonary alveoli and liver. The details of his work and experiments on animals were recently described in a paper read at a meeting of the Royal Society of Tropical Medicine and Hygiene.

8. Specimens and illustrations of various parasites and carriers of diseases affecting man and animals were exhibited by Professor NUTTALL, who also showed a collection of portraits of those who have advanced the subject of parasitology.

9. Demonstration of the use of the Mobile Laboratory for Malaria Inquiries in England by Lieutenant-Colonel S. P. JAMES, of the Ministry of Health.

10. A lecture, illustrated by lantern slides, on "Serbia under Typhus in 1915: the Story of a Great Epidemic and its Arrest," was given by Dr. W. HUNTER

EXHIBITION OF SURGICAL AND ELECTRICAL APPLIANCES, DRUGS, AND FOODS.

II. *Drugs, including Antiseptics*—*Continued from p. 140.*

The pharmaceutical products shown by the Anglo-French Drug Co., Ltd., of 238A, Gray's Inn-road, London, W.C., claimed much attention. These were chiefly of French origin, and included the arsenical compounds, galyl, novarsenobenzol, and glucarsenol, a glucose solution of the latter with analgesics. The visitors' attention was also drawn to the employment of stannoxyl—metallic tin and pure oxide—in staphylococcus infections, and a preparation called "elixir bromo-valerianate," odourless and tasteless, with or without strontium bromide is worthy of notice as an advance in pharmaceutical preparation. Modern organo-therapeutic products were well represented by the G. W. Carnrick Co., of New York, and 6, Northumberland-avenue, London, W.C. Hormotone, for example, is described as a combination of those hormones of internal secretion, which coöperate in maintaining the dynamic force of the organism, the sthenic as against the asthenic condition. Tryposegen, an extract of the pancreas, claiming to be useful in completing sugar metabolism in diabetic cases, was another item, and as well were shown specimens of various desiccated extracts, anterior pituitary, suprarenal, lymph, testicular, and so forth. The exhibit of Messrs. Howards and Sons, Limited, of Ilford and Stratford, was interesting. First in the list we may place agotan (2 phenylquinoline, 4 carboxylic acid) described as extraordinarily efficacious in eliminating uric acid from the system. Then they showed the hydrogenated derivatives of the cinchona alkaloids (hydroquinine, amongst others), which have been found by some to exhibit therapeutical advantages over their parent, the classic quinine of the materia medica, in malarial treatment. There was included the standard ether of this firm kept closely to physical constants, a proceeding clearly desirable in anæsthetic work.

It is noteworthy that the element sulphur should play an avowed part in the treatment of rheumatism and allied disorders, whether it be by Harrogate water, colloid, ichthyol, or the time-honoured mustard. These remarks are prompted by the special medical mustard bran prepared by Messrs. J. and J. Colman, of Norwich and Denmark-street, St. George's-street, London, E. This preparation is claimed to retain heat and moisture longer than other forms of poultice. Samples of mustard prepared particularly for use in the bath were also exhibited.

III. *Special Foods.*

Foods of particular interest in medical practice were not much in evidence, and, generally speaking, this division of the exhibition showed a small following compared with previous occasions. Experts in the preparation of special foods must have found considerable inconvenience by the restricted supply of raw materials through the war, and this fact may account for the small presentation. The chief interest lay in those foods which are claimed to contain the accessory food factors. The composition of some well-known foods peculiarly useful as accessories in infant feeding proves to have been based unwittingly on the inclusion of these factors.

Virol, for example, of Virol, Ltd., 152, Old-street, London, E.C., is presented in a new dietetic light when we consider that it is made up of marrow and beef fats, malt extract, eggs, lemon syrup, all including, with care in manufacture, the three vitamines unimpaired. Similarly, Messrs. Oppenheimer, Son, and Co., Ltd., of 179, Queen Victoria-street, London, E.C., exhibited samples of "roboleine" based on a collection of well-known materials bearing food accessory factors contained in malted barley, red bone marrow, and neutralised lemon-juice. The preparation is marked by an attractive palatability welcome to the growing child. Full-cream dry milk products were well exemplified in the exhibit of glaxo by the Glaxo Company of 155–157, Great Portland-street, London, W. This product shows the complete composition of cow's milk minus, of course, the 88 per cent. of water. A claim is made for its vitamine content. In addition to their well-known palatable starchless and sugarless foods for diabetic patients—bread, biscuits, cakes, preserves, and beverages—Messrs. Callard and Co., of 74, Regent-street, London, W., exhibited a new food preparation, vitmar, which we have already noticed in our analytical columns. While showing a high calorific value care has been taken to vitalise the preparation with all three accessory food factors founded on the use of ingredients containing them.

IV. *British Spas.*

The formation of a British Spa Federation will be welcomed as indicating the waking up of the authorities of our home watering-places to the health assets they possess. There was ample illustration of this in the exhibits of these resorts. Considering the limited area of our islands, the natural balneological resources are remarkable. There is Bath, with its impressive supply of hot water (120° F.) amounting to half a million gallons daily, and reeking with radium emanation. There is Harrogate, with its famous sulphur waters and its magnesia and chalybeate wells amidst a most attractive and health giving environment. There is Buxton, also situated amongst charming surroundings, with its thermal and radio-active springs. There is peaceful Cheltenham, with its natural aperient waters; Droitwich, with its brine wells; Woodhall Spa, with its saline water in which iodides count as important therapeutic constituents. Sulphur, again, is presented in the waters of Llandrindod Wells. All these establishments possess accessories in the shape of electrical apparatus, light and heat treatment, and mechanical balneological appliances, now recognised as giving relief in many cases. The authorities are realising also that régime is an important insistent in treatment, and that patients rightly expect healthy amusement and occupation to make their visit enjoyable as well as medicinal.

V. *Literary Exhibits.*

A much appreciated section of the exhibition was its literary side, comprising a group, so to speak, of small libraries presenting recent medical works, standard text-books, monographs, and so on. Amongst the publishers showing material in this division were: Messrs. H. K. Lewis and Co., Ltd., of 136, Gower-street, London, W.C.; the Cambridge University Press, of Fetter-lane, London, E.C.; Messrs. D. Appleton and Co., of 25, Bedford-street, London, W.C.; Mr. E. A. Brooke-Williams, of 8, Henrietta-street, London, W.C.; Mr. Edward Arnold, of 41–43, Maddox-street, Bond-street, London, W.; the J. B. Lippincott Co., of 16, John-street, Adelphi, London, W.C.; Mr. William Heinemann, of 20, Bedford-street, London, W.C.; the W. B. Saunders Company, Ltd., of 9, Henrietta-street, Covent-garden, London, W.C.; Messrs. Macmillan and Co., of St. Martin's-street, London, W.C.; Messrs. John Wright and Sons, of Bristol; the Oxford Medical Publications, of Warwick-square, London, E.C.; and Mr. H. R. Ellis, of 9, Lovell's-court, Paternoster-row, London, E.C. The collection was significant of a revival of medical literature since peace was established.

Public Health.

REPORT OF THE LONDON COUNTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER, 1919.

UNDER the above title Dr. W. H. Hamer has presented to the London County Council a combined report which, like its several predecessors, abounds with important considerations for the welfare of the dwellers in the metropolis. We give here a brief survey of its main features, reserving for future comment many important matters of detail.

By including his remarks on elementary education in the same volume with his advice as official guardian of the public health Dr. Hamer indicates his adherence to the conviction that the time-honoured system of separate treatment of these subjects is not only indefensible but actually wasteful. The recent decision of the County Council to amalgamate, under one administration, two previously independent departments has been abundantly justified by subsequent experience.

General Health Lessons.

In a prefatory note Dr. Hamer reviews the more important lessons inculcated during 1919 after five years of war and under the exceptional strain and stress then endured. In certain respects he regards 1919 as a record year. "The hand of war, famine and epidemic disease (he writes) was still outstretched over Central and Eastern Europe, though it is difficult to assess with any degree of accuracy the amount of misery and privation prevailing there. On the other hand, in the two largest aggregates of population—New York and London—the year was one of phenomenally low mortality. Conditions arising out of the war continued, in large measure, to dominate the situation throughout the world, though their effect upon the death-rates in 1919 was so dissimilar in the places above referred to." The experience of the last 70 years, in which hygiene and preventive medicine have made so much progress, shows that following upon a time of conflict and strife there almost inevitably succeeds an era not so much pacific as hypercritical, and Dr. Hamer is unwilling to follow the parrot cry of "physical deterioration" among the people. So far as infectious disease is concerned, he admits that it is the post-war period rather than the war period itself that threatens the safety of civilians dwelling outside the area of hostilities.

For nearly six years civilian migration into and out of this country has practically ceased. It is only now, nearly 18 months after the armistice, that there is any prospect of resumption of the pre-war movements of emigrants passing through London on their westward way. The year was essentially a period of transition from the war conditions of 1918 to so-called normal conditions towards the close of 1919. The majority of the war refugees were repatriated early in the year, and with the return of American and Colonial troops and the demobilisation of British forces there resulted, by the middle of the year, an addition of about 400,000 to the London population. It is therefore specially gratifying to learn that the mortality in the latter half of 1919 was lower than in any corresponding period for many years.

Infectious Diseases.

Taken as a whole, the year under notice was one of exceptionally favourable mortality, although there was considerable increase in the loss of life from influenza and allied causes in its first quarter. Except for a fortnight of cold and inclement weather in February the meteorological conditions were favourable to health. The exceptional immunity from infectious maladies experienced in the few years immediately preceding was not maintained in 1919; the number of notifications was, however, still below the average. *Diphtheria* showed increased prevalence, the attacks being in excess of those of any year since 1902. *Scarlet fever*, which had fallen to a minimum incidence in 1917, has since steadily increased, both in London and in the provinces, and there is now every prospect of another period of greater prevalence. *Typhus* was epidemic in many parts of Europe during 1919, but only two cases were notified in London. *Dysentery* caused 86 deaths, as against 313 in the previous year. *Enteric fevers* showed still further decline on the remarkably low rate of recent years. The low incidence of these diseases is the more remarkable because the population of London was, owing to demobilisation, temporarily increasing by immigration from all parts of Europe. But while the civilian community has escaped thus lightly, there was still unusual prevalence of typhoid in certain of the London mental hospitals, though the attacks there were less than half as many as those registered in 1918. The remarkable freedom of the army from this disease, as compared with earlier military experiences, has been widely ascribed to preventive inoculation. But on this point Dr. Hamer remarks that whatever the conclusion may be with regard to the soldiers, it is clear that this explanation cannot hold with regard to the civilian population, for only a small percentage of these were inoculated, and yet the number of attacks amongst them since 1914 has distinctly fallen.

Tuberculosis.—Among the civilian population the deaths referred to pulmonary tuberculosis numbered 5332, and to other forms of that infection 992, both these numbers being far below those of the previous year. The notified cases of "primary tuberculosis" totalled 15,587, a number below the average in the previous five years.

Influenza, cerebro-spinal fever, poliomyelitis.—In the last report Dr. Hamer suggested that "all the above-named forms of epidemic disease were manifestations of one and the same influence." This year he returns to his argument in favour of a common infecting agency in regard to the associated prevalence of disease, encountered coincidentally with influenza in its pandemic phase. Recent bacteriological literature encourages him to regard bacterial mutation as a phenomenon demanding careful investigation.

Birth-rate and Infantile Death-rate.

Estimates of the civil population have been based, since 1914, on the National Register of 1915, supplemented by information connected with the rationing of food. The civil population of London County thus estimated was 4,358,309 in the year under notice, an increase of 403,755 on the estimate of the previous year. The Registrar-General estimates the County birth-rate at 18·2 per 1000 living, as compared with 16·0 in 1918. A rapid increase in the registered births was noted in the latter half of the year, and in the closing weeks of that period the numbers far exceeded even pre-war figures. The civilian death-rate in 1919 is estimated at 13·6 per 1000, as compared with 19·2 in the preceding year. Among infants under 1 year the mortality was only 85 per 1000 births—the lowest rate on record. The notably light mortality from measles and whooping-cough largely accounts for this saving of infant life; but in addition to this the deaths from tuberculous and other respiratory affections were below the average, notwithstanding the influenza epidemic.

Medical Inspection and Treatment of School Children.

In this section Dr. Hamer gives an interesting account of the efforts of his department for the improvement of the health and physical condition of school children. The total number of children medically inspected during 1919, exclusive of scholarship children, was 265,230, compared with 255,631 in the preceding year. It is gratifying to note that with regard to more than three-quarters of the children entering school a parent interviews the doctor and obtains his advice concerning the precautions necessary in the interest of the child's health. The proportion of children found in need of treatment for physical defect was slightly lower than in the previous year. At routine inspections 83,007, or 42·6 per cent. of the children examined, were referred for treatment, as against 44 per cent. in the previous year.

From an instructive table the variations are shown in the condition of the children under the headings

of *clothing*, *nutrition*, and *cleanliness*. Based on the huge number of 200,000 examinations yearly these figures give valuable indications of the changes brought about in the condition of the people by varying economic and social influences. During the years of war this information became an encouraging feature, "demonstrating as it did that the children were not only shielded from the stress of war conditions, but that they were more tenderly looked after during those gloomy years than they had been in the previous piping times of peace." It is legitimate to dwell upon all improvements in the condition of children, but such improvement must not blind us to the ever present truth that there still are with us many children suffering from malnutrition, parasitic contagion, and ill-health. It is more than ever necessary to scrutinise these conditions during the difficult times through which we are passing or may be about to pass. In regard to *sufficiency of clothing* we learn that the percentage of children insufficiently clad was 2·5 in the year under notice, against 2·2 in 1918. Infants continue to be better cared for in this respect than older children, and girls are always better clad than boys. As to *nutrition* the condition of children progressively improved, until in 1918, as compared with the pre-war years, there were less than half the number of ill-nourished children in the schools. In 1919, however, there was perceptible deterioration of nutrition. It is to be feared that this must be attributed to the rise in price of the foods most needed by children, and notably in the cost of milk. In the year under notice 6·1 per cent. of the children were under-nourished, against 5·5 per cent. in 1918. As regards *personal cleanliness* and measures for securing *freedom from verminous infestation* the report is very instructive. In 1916 and 1917, for example, the percentage of 8 year old girls with heads free from parasitic infection was 68·8, whilst in 1919 it was 74·2. Striking improvement at other ages is also recorded during the last two years. It is clear, however, that the time has not yet arrived when the campaign against these dirt conditions can with safety be relaxed.

Institutions for medical treatment.—At the close of the year under review there were 57 centres actually at work for the treatment of school children. The total number of cases for which facilities are thus provided was 174,878. These figures may be compared with the 42 centres providing for 99,000 cases in 1914 or with the 17 centres providing for 26,000 cases in 1910, the year in which the medical treatment scheme was inaugurated.

URBAN VITAL STATISTICS.

(Week ended July 17th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 10·1, 9·9, and 9·9 in the three preceding weeks, was again 9·9 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 10·1, or 0·5 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 2·8 in York, 3·4 in Lincoln, and 3·9 in Ilford, to 15·3 in Merthyr Tydfil, 15·7 in Sunderland, and 17·5 in Wolverhampton. The principal epidemic diseases caused 180 deaths, which corresponded to an annual rate of 0·5 per 1000, and comprised 68 from infantile diarrhœa, 34 from diphtheria, 33 from measles, 30 from whooping-cough, 12 from scarlet fever, and 3 from enteric fever. Measles caused a death-rate of 1·6 in Wolverhampton, 1·7 in Stockton-on-Tees, and 1·8 in Northampton; and whooping-cough of 1·3 in Gateshead and 1·5 in Merthyr Tydfil. There were 1855 cases of scarlet fever and 1582 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1755 and 1599 respectively at the end of the previous week. The causes of 22 of the 3381 deaths in the 96 towns were uncertified, of which 4 were registered in Birmingham and 4 in Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 11·5, 11·1, and 12·1 in the three preceding weeks, fell to 11·1 per 1000. The 268 deaths in Glasgow corresponded to an annual rate of 12·6 per 1000, and included 4 each from small-pox and infantile diarrhœa, 3 from whooping-cough, and 1 each from measles and scarlet fever. The 66 deaths in Edinburgh were equal to a rate of 10·1 per 1000, and included a fatal case each of measles and diphtheria.

Irish Towns.—The 125 deaths in Dublin corresponded to an annual rate of 15·7, or 1·5 per 1000 above that recorded in the previous week, and included 4 each from whooping-cough and infantile diarrhœa and 2 each from measles and diphtheria. The 94 deaths in Belfast were equal to a rate of 11·9 per 1000, and included 2 each from enteric fever and infantile diarrhœa and 1 from scarlet fever.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Cmdr. J. St. J. Murphy placed on retired list medically unfit.

ARMY MEDICAL SERVICE.

Major-Gen. S. Macdonald retires on retired pay.

ROYAL ARMY MEDICAL CORPS.

Capt. F. C. Davidson retires, receiving a gratuity, and is granted the rank of Lieutenant-Colonel.

Lieut. W. H. Palmer to be Captain.

Officers relinquishing their commissions:—Temp. Capt. A. Brown (granted the rank of Lieutenant-Colonel). Temporary Captains granted the rank of Major: A. C. Norman, W. Dunlop, G. Young. Capt. W. H. Palmer (retains the rank of Captain). Temporary Captains retaining the rank of Captain: S. P. Hyam, J. E. Kesson, J. P. Howe, R. T. G. Aickin, W. Leslie, A. Morrison, M. A. MacDonald, W. W. Morrison, J. W. Robertson, G. B. Egerton, L. J. F. Bull, M. McGillivray, H. Morley, E. ff. Creed, I. M. Robertson, T. H. J. Douglas, B. Sergeant, J. M. H. Campbell, J. B. Kirk, D. C. Buchanan, J. Irving, E. J. Coombe, R. Hilliard, G. P. W. Staunton, J. K. T. Mills, G. P. N. Richardson, C. G. Coombes, J. H. Thomas, R. T. Lewis, C. C. Harrison, W. D. Miller, J. R. Harris, W. Dempster, W. M. Jones, R. W. H. Miller, H. W. Lewis, G. M. Herriott, R. Thom, C. V. Pink, L. P. Johns, P. D. McLaren, O. St. L. Campion, C. V. Pearson, W. R. McLinden, H. St. H. Vertue, W. Oats, F. B. Jago, R. H. Chadwick, W. F. Kivlichan, T. R. Wilson, H. N. Pritchett, C. E. H. Paley, M. M. Frew, W. B. Bannerman, G. de H. Dawson, A. Coupe (on ceasing to be employed as a Dental Surgeon). Temp. Lieut. J. C. J. Callanan (retains the rank of Lieutenant).

Oversea Forces: South African Medical Corps.—The undermentioned relinquish their temporary commissions on ceasing to be employed: Lieut.-Col. Sir E. N. Thornton (retains the rank of Lieutenant-Colonel); Capts. H. R. J. Sutton (granted the rank of Major) and R. P. Mitchell (retains the rank of Captain).

The undermentioned relinquish their commissions on account of ill-health: Major M. R. C. Hoare (retains the rank of Major); Capts. P. D. Hamilton and H. J. Orford (granted the rank of Majors) and Capt. R. I. Wolfe (retains the rank of Captain).

Temp. Capt. J. M. Mitchell, R.A.M.C., has been appointed an Officer of the Military Division of the Most Excellent Order of the British Empire for valuable services rendered in connexion with military operations in South Russia.

SPECIAL RESERVE OF OFFICERS.

Capt. B. W. Brown relinquishes his commission and retains the rank of Captain.

TERRITORIAL FORCE.

Capt. F. E. Stokes to be Major.

Capt. S. S. Greaves to be Deputy Assistant Director of Medical Services, West Riding Division.

Major H. Fulton resigns his commission and is granted the rank of Lieutenant-Colonel.

Capt. (acting Major) E. G. T. Poynder relinquishes the acting rank of Major.

Majors resigning their commissions and retaining the rank of Major: G. W. Fitzgerald and H. A. T. Fairbank.

Capts. O. L. Rhys and A. C. F. Turner resign their commissions and are granted the rank of Lieutenant-Colonel.

Captains resigning their commissions and granted the rank of Major: W. V. Wood, J. H. Lloyd, S. H. Rentzsch, W. B. Hill, S. R. R. Matthews, C. E. W. MacDonald, and R. G. Dixon.

Captains resigning their commissions and retaining the rank of Captain: T. I. Mills, H. W. Bayly, E. H. Coyne, D. Davidson, C. W. Fort, P. McRitchie, C. P. Sargent, and A. C. Wilson.

2nd Western General Hospital: Capt. G. E. Loveday resigns his commission and retains the rank of Captain.

1st Eastern General Hospital: Capt. W. L. Murphy resigns his commission and retains the rank of Captain.

1st Scottish General Hospital: Major Sir H. McI. W. Gray resigns his commission and is granted the rank of Colonel.

Lowland Divisional Sanitary Section: Capt. T. J. Mackie resigns his commission and retains the rank of Captain.

TERRITORIAL FORCE RESERVE.

Col. D. W. C. Jones resigns his commission and retains the rank of Colonel.

Capt. E. G. Gauntlett resigns his commission and is granted the rank of Major.

Capts. B. K. T. Collins and C. C. Ling resign their commissions and retain the rank of Captain.

ROYAL AIR FORCE.

Capts. J. P. Hennessy and J. Chambre are transferred to the unemployed list.

Correspondence.

"Audi alteram partem."

THE MYOCLONIC FORM OF ACUTE EPIDEMIC ENCEPHALITIS.

To the Editor of THE LANCET.

SIR,—Probably one of the earliest recorded cases of the condition in this country was the one shown at the meeting of the Section for the Study of Disease in Children of the Royal Society of Medicine on Jan. 24th, 1919. The child, a little girl of 2 years 11 months—curiously enough, an Italian—was under my care at the Hospital for Sick Children, Great Ormond-street, in 1918. Some Fellows of the society held the case was an encephalitis. I maintained it was a myoclonus multiplex, knowing that this was a safe position, since neither the cause of encephalitis nor myoclonus was absolutely clear. The onset was abrupt and the case described in fair detail in the *British Journal of Children's Diseases*, Vol. XVI., No. 187–189, pp. 156–157. It would appear both views were correct—an amiable solution. I followed the case to a fair recovery 18 months later.—I am, Sir, yours faithfully,

F. JOHN POYNTON, M.D.

Devonshire-place, W., July 21st, 1920.

To the Editor of THE LANCET.

SIR,—The cases described by Dr. A. W. M. Ellis in THE LANCET of July 17th are less novel in England than may be thought. Dr. W. B. Russell, for example, described one in your columns in 1918 (July 27th). But, as a matter of fact, when acting as medical registrar at the London Hospital in 1918 I saw many such. Unfortunately, owing to the precipitancy with which the name "encephalitis lethargica" had been adopted by the Local Government Board, and the early and resolute conviction of so many that we had to deal with an affection of which lethargy was the specific index, it became extremely difficult to excite interest in the myoclonic phenomena of lethargic cases, or in those cases with no lethargy but much myoclonus. It was, indeed, not realised that we had to do with a perfect shower of cases exhibiting, severally and collectively, almost every conceivable manifestation of acute encephalomyelitis and meningitis. However, at the discussion on Epidemic Encephalitis at the Royal Society of Medicine (Oct. 15th, 1918) I stated that, of 127 cases seen in the first half of the year (of which 120 were at the London Hospital), 15 manifested epileptiform "fits," 2 showed marked trismus, and 22 tremors, twitchings, or chorea in a marked degree. These statements excited obvious risibility, but I have the full notes still in my possession. Moreover, I pointed out that of 51 cases submitted to lumbar puncture 4 showed cerebrospinal leucocytosis in excess, and 2 others in marked excess, whilst some lymphocytosis was present in 31.

In an earlier communication[1] it had been already suggested that, as now generally recognised, cell excess in the cerebro-spinal fluid from cases of encephalomyelitis is related to the extent and degree of meningeal inplication present. But, in a personal letter to me, dated June 19th, 1918, the late Sir William Osler, after writing what I cannot forbear to repeat—that the paper just referred to was "the most sensible thing written on the subject"—went on to say that "encephalitic features of this outbreak are most interesting, *particularly* the choreiform movements and incoördination."

Sir Willian Osler, who lectured at Oxford on this myoclonic form in June, 1918, brought all these cases, whether lethargic or convulsive, together with acute anterior poliomyelitis, under the same heading—acute epidemic encephalo-myelo-meningitis. And it is this view which is destined to prevail. The epidemiological phenomenon remarked by Dr. Ellis (the "tendency of the virus to new localisation") is, of course, quite familiar in respect of many epidemics. In some epidemics of diphtheria, for example, many cases are nasal; in others there is a high percentage of laryngeal cases; in others, again, there is much paralysis of this, that, or the other type. And the historical records of epidemic encephalomyelitis and meningitis show clearly what Wickman proved for the limited Heine-Medin conception; that, though in each epidemic all types are recognisable, nevertheless in different epidemics different types preponderate. The old Kriebel-krankheit and Willis's convulsive fever of 1661 were of the myoclonic type, but Saillant, in 1776, hit the nail on the head when, in describing the "*maladie convulsive épidémique attribuée par quelques observateurs à l'ergot*," he pointed out that, in successive epidemics, the clinical phenomena tend to assume different forms.

All the forms noticed and described by me at the London Hospital in 1918 have since been described by different authors as "new affections" or "new types," and it was a case of the myoclonic type which, becoming certified as "acute delirious mania," convinced me of what I had long suspected—that Luther Bell's disease—"acute delirious mania"—is but an encephalitis occurring during influenza periods, with psychical symptoms paramount.

I am, Sir, yours faithfully,

Wimpole-street, W., July 19th, 1920. F. G. CROOKSHANK.

[1] THE LANCET, 1918, i., 699.

To the Editor of THE LANCET.

SIR,—I am grateful for the excellent account by Dr. A. W. N. Ellis of three fatal cases of acute epidemic myoclonic encephalitis in your last issue. After reading most of the available literature on the subject of acute encephalitis lethargica (in the English language), and observation of some cases in my practice during the first three months of the year, and a few cases of the myoclonic variety in consultation with some of my colleagues during the last three months, I am still far from being convinced that the disease is a distinct entity of its own.

From purely clinical observations of the cases seen by me, with no available opportunities for the more thorough study of them, such as blood examinations, chemical and pathological examinations of the urine and cerebro-spinal fluid, &c., I have yet to be convinced that these conditions are not really influenzal or post-influenzal manifestations. The cases observed by me in the early months of this year were to me obviously influenzal. In one of the cases a condition of marked myoclonus of one upper limb was a distinct sequela a week or so after the patient recovered from his lethargy. In another persistent vomiting was present, which soon only manifested itself when the patient moved her head to one or other side. This then improved, and for a further 10 to 14 days she only vomited if she sat up in bed. I saw a very similar case to the latter with a colleague only last week.

In 1903, whilst engaged as assistant in a large industrial area during an influenza epidemic not of a virulent type, I had one instance of the same myoclonic condition in the left arm as asequela, which ultimately disappeared with no special treatment.

I have just received the current number of the "Medical Clinics of North America." The first article is devoted to "Encephalitis Lethargica," written by no less an authority on nervous diseases than Dr. Charles Louis Mix, of the Mercy Hospital, Chicago, and in discussing the ætiology he states as follows: "Personally, I am of the opinion that although the germ of encephalitis lethargica has not been discovered, it is nevertheless a post-influenzal affair." The publication of further cases of encephalitis lethargica, whether "myoclonic" or "amyoclonic," with the available minute examinations and equipment necessary for their detailed study, will undoubtedly pave the way for a thorough and complete knowledge of the ætiology and pathology of these most interesting conditions.

I am, Sir, yours faithfully,

July 19th, 1920. GENERAL PRACTITIONER.

SETTLEMENTS FOR CONSUMPTIVE EX-SERVICE MEN.

To the Editor of THE LANCET.

SIR,—In the *Ex-Serviceman* a discussion has been going on for some time as to the inadequacy of the after-care provision for tuberculous ex-Service men after they have left the sanatorium. A suggestion has been made by a gentleman writing from the Royal Colonial Institute that a colony should be founded in some of our overseas possessions to which suitable men with arrested or quiescent lesions might be sent. Jamaica is said to be an ideal place for the consumptive settler; not in the plains but high up in the Santa Cruz mountains, near Malvern. If the scheme matures the question of funds may bar it. Would Dr. Batty Shaw consider this a suitable opportunity to test the value of a tuberculosis settlement in a dry warm climate, where the chance of mixed infections and catarrhs of the lung would be minimal? I refer to his instructive lecture reported in THE LANCET of Jan. 24th last.

I am, Sir, yours faithfully,

J. PIRIE, M.D.

Moorlands, Canford Cliffs, Bournemouth, July 18th, 1920.

HIBERNATING MOSQUITOES AS CARRIERS OF MALARIA.

To the Editor of THE LANCET.

SIR,—Will you kindly permit me to endorse Colonel S. P. James's remarks contained in your issue of July 10th (p. 99) regarding the importance of Dr. C. M. Wenyon's observation that in the Balkans anophelines with partially developed malaria zygotes hibernate there in the winter. So far as the epidemiology and preventive measures of malaria in India are concerned, this observation may be one of primary importance.

I have elsewhere expressed the opinion that in many stations of the United Provinces and Punjab in India infection through anophelines occurs for one or two months during the late spring and early summer if in March or April there happen to be some heavy falls of rain. This means that under these circumstances there may be two malarial seasons in such places—one, which is short, in the late spring and early summer, and the usual one during and after the monsoons have begun. When this observation was originally made I could give no evidence in support of it except that of the malaria statistics of certain districts and the existence of breeding-grounds of anophelines, in which their larvæ were found during the period specified at several stations; it should not be difficult to prove or disprove in such places, as there are always in existence breeding grounds for anophelines and cases of residual malarial infection. Further work from, say, the middle of March to the middle of May should elicit whether this is actually the case or not, and whether malaria-carrying species of anophelines disseminate malaria at that particular time of the year. This could be ascertained by taking a sufficient number of anophelines in native huts at that time and determining the sporozoite-rate.

I have also noted that there are some stations in which the winged malaria-carrier cannot be found after Oct. 15th, others in which it may be found at the end of October and well into November. In all stations in Northern India a certain number of anophelines continue on the wing and carry malaria for weeks or even months after the breeding season is over. For the observations that led to my originally expressing this latter opinion I was indebted to a suggestion contained in that excellent book, "The Practical Study of Malaria," by J. W. W. Stephens and S. R. Christophers. When these statements were made it never struck me that anophelines could hibernate in the infected state throughout the winter, and I believe that as regards India this has not hitherto been suggested, or I have not come across it if it has. Several malariologists in India have advocated the destruction of hibernating mosquitoes with the view to reducing the numbers that would come into operation when the breeding season began again, but not with the idea that some of these hibernating insects were already infected. The hibernation of adult anophelines on the plains in India is carried out mainly in secluded sheltered corners of houses, under surface of shelves, unused almirahs, up chimneys, in store-rooms, stables, servants' out-houses, in huts of bazaars, in cow-byres, and old ruins, in which these mosquitoes creep into cracks that often appear too small to give them admission. There would be no difficulty in collecting these, and if they are malaria-infected estimating the zygote-rate for each month during the hibernating period.

In India we have been in the habit of considering that the cases of spring malaria occur as relapses of old infections brought on by the chills due to lowered atmospheric temperature and winds associated with the "spring-crops showers" of March and April, and that these residual malaria cases then form the reservoirs from which the new broods of anophelines disseminate infection. Colonel James, in his recently published book, "Malaria at Home and Abroad" (which should be considered a *vade mecum* by all practical investigators of malaria), states at p. 94 "..... as regards initial malaria in England in 1918 ..... there are records of a few new infections as early as May. ..... An infection in May or earlier must have been due to an anopheline which has lived through the winter, for in that year the first brood of new adult anophelines did not appear until quite the end of the month. The particular anopheline concerned might have become infected in the previous autumn and lived through the winter with sporozoites in its salivary glands, or, as was suggested by Captain Macdonald, R.A.M.C., it might have been wintering in an artificially heated room occupied by a malaria carrier." Several important suggestions are embraced in these remarks. It is too late to start observations in India regarding anophelines that possibly hibernated in the infected state last winter, but it is not too early to commence organising a series of investigations for the ensuing cold weather that would settle this highly important question once for all as regards that country.

In general terms it may be stated that up to date in India antimosquito measures are closed down when the breeding season of mosquitoes terminates, and, as a rule, not recommenced until the ensuing rainy season. If it is found that some of the malaria-carrying species of anophelines do hibernate in the infected state our position in connexion with antimalarial measures is greatly strengthened and a new line of defence is opened out—that of devising measures of destroying them in their winter quarters. Special interest will be felt in Dr. Wenyon's promised paper on his experiments in connexion with hibernating infected anophelines in the Balkans.

I am, Sir, yours faithfully,

P. HEHIR,

London, July 12th, 1920. Major-General, I.M.S. (ret.)

FUNCTIONAL NERVOUS DISORDERS.

THE CAUSAL FACTORS.

To the Editor of THE LANCET.

SIR,—It is unfortunate that Dr. Judson Bury in your issue of July 10th did not define the neuroses that he dealt with in his paper on the Physical Element in the Psycho-neuroses. He described hysteria and neurasthenia, but ignored psychasthenia. Let us, therefore, turn to the simplest definition and classification, that of Purves Stewart:—

(*a*) *Neurasthenia.*—A disease resulting from the hypersecretion of the endocrine glands, the stimulation of which may be physical (toxæmia, trauma, &c.) or psychical (worry, fright, &c.). If we accept this definition, and I cannot see how we can do otherwise, we can at once see how a long past stimulus is capable of being a causative agent in a present neurosis; thus: stimulus —> hypersecretion of adrenals —> "quicker living" —> exhaustion and consequent demand for more secretion —> hypersecretion, and so on.

(*b*) *Hysteria.*—Purves Stewart accepts Hurst's definition:—

"That hysteria is a condition manifesting itself by symptoms which can be reproduced by suggestion, and which can be made to disappear again by persuasion and suggestion."

Dr. Bury does not; but as he fails to give us anything in its place, we may for the purpose of this argument adhere to Hurst's ideas.

(c) *Psychasthenia.*—As Dr. Bury does not mention this neurosis we need not deal with it here.

It will be noted that the conditions known as "anxiety-neurosis," "conversion hysteria," &c., are included in the above; and, surely, rightly so. For instance, anxiety is a symptom present in all the psychoneuroses; if it predominate in any one case, why label the ailment "anxiety-neurosis" and push it into a class by itself?

Let us now see wherein those who claim "mental factors as much more important than bodily" differ from Dr. Bury.

Neurasthenia.—So far as I am aware psychotherapy does not claim to be able to cure this disease; moreover, the vast majority of psychotherapists are in practical, if not entire, agreement with the paragraph on the biochemic aspect. In fact, we can say that neurasthenia is not a true psychoneurosis; it is an organic disease which will yield, not to psychotherapy, but to "fresh air, sunlight, cheerful surroundings, and light work"; in two words, physiological rest. However, "anxiety states" so often occur in true neurasthenia that psychotherapy is a useful adjunct in treatment.

Hysteria.—Dr. Bury describes an illustrative case and then develops his argument that the causative factor is physical and in the nature of a "synaptic breakdown." Possibly; but may I suggest that he observe his patient when recovering from a general anæsthetic, or better still, under hypnosis? In similar cases, when there has been any reason to anæsthetise them, I have always found that the nervous elements involved were intact. For example, I have in my care at present a patient who is stone deaf, and also afflicted with such a spasmodic stammer that he is practically dumb. Note that here we have not only muscles involved, but also a special sense.

A few days ago I anæsthetised my patient deeply, and then, as he was coming round, I began talking to him in an ordinary conversational tone. After a little while he replied when called by name, and finally, when I told him to converse with an orderly by the bedside, he did so. At this time his hearing was perfect, and so was his speech. A few minutes later, as he recovered from the anæsthetic, his hearing and speech left him in the middle of a sentence. Now, are we going to say that this man is suffering from a "block in his synaptic connexions"? How can an anæsthetic remove this block? (Note that at the time of the "recovery" the patient was only *partially* and lightly "under.")

How can the "synaptic block" act so that return to consciousness was accompanied by a dramatic relapse? Is it that this man is a malingerer? Well, he has been under close observation for five months, not only by M.O.'s, but also by orderlies, and not a shred of evidence that he is a malingerer has been noted; moreover, from a disciplinary point of view he is an excellent patient. Personally, I fully believe that he has no conscious control over his ailment, and I cannot see how the causal factor can be anything but psychical.

I am, Sir, yours faithfully,

A. G. MIDDLETON,
Medical Superintendent, John Leigh Memorial Hospital (Neurological), Brooklands, Cheshire.

July 15th, 1920.

A PLEA FOR A UNIFORM PSYCHOTHERAPY.

To the Editor of THE LANCET.

SIR,—Of recent years, more especially since the war, the treatment of disorders of functional origin has been occupying an ever-increasing amount of medical and public interest. For the practitioner in general work the nomenclature employed by psychopathologists must be bewildering. Not only does this apply to the terms in use for describing the disorders themselves, but to the mechanisms producing these disorders, and even the methods of treatment are described by authors belonging to different schools of thought in language the meaning of which varies with the individual writer.

One reason for this, although perhaps not the only one, is that the work of Freud, Jung, Adler, and others has laid stress upon an entirely new conception of the mind—namely, the "unconscious." As Mr. Tansley points out in his recent book, psychology, prior to the work of the psycho-analytic school, concerned itself mainly with the study of the mind by introspection, and therefore dealt only with facts of phenomenal consciousness. Of recent years, however, the results of this form of investigation have failed to satisfy even the academic psychologist, so that he, in common with others, has sought for psychological conceptions yielding results of a more practical nature. The widespread interest aroused by the conception of an area of the mind outside consciousness, which directs and governs consciousness, seems to be the result of this discontent. In this country, as well as on the continent, numbers of books have been written dealing with the mental mechanisms first outlined by Professor Freud, and with the views of his adherents and opponents. Such books are either purely psychological or designed for the better understanding of nervous disorders, in which case they are of direct interest to every medical man called upon to treat patients so suffering.

Prior to 1914 psychopathology and psychotherapy were studied by few medical men, and treatment of functional disorders by mental medicine was carried out by a relatively few physicians. At the present time, however, there are a large number of individuals, both within and without the profession of medicine, who essay to treat derangements of nervous origin by means of psychotherapy. It is obvious that treatment should be carried out by those trained in the practice of medicine rather than by members of the laity, whose experience is often confined to the perusal of psychological treatises, and this if only for diagnostic reasons. The importance of this will probably be sufficiently emphasised by referring to an article by Dr. Judson Bury in the issue of THE LANCET of July 10th. This author lays stress upon the physical element in the causation of the psycho-neuroses; and I venture to think that this aspect of the subject must perforce be overlooked by the layman who treats patients by psychological means. But the majority of medical men, whose experience of the treatment of these disorders makes their opinion of value, are agreed, I believe, that in psycho-neuroses, certainly of any long standing, both physical and psychical changes are generally obvious, and that treatment, therefore, need not be confined to one method.

If, therefore, it is agreed that treatment by psychotherapy is better carried out by qualified practitioners, it is necessary that medical men should be conversant with a nomenclature in general use and should be able to form some judgment as to which patients are suitable for psychotherapeutic treatment, either by the doctor himself or by a specialist. At the present time, however, conflicting statements on this subject appear almost every week in the medical journals; and it is no uncommon occurrence for the same number of a journal to contain two articles on some aspect of this subject, which are not only written by authors whose views are diametrically opposed, but which are even in violent opposition. The strides which psychological treatment has made of recent years are, of course, so rapid, that difference of opinion must of necessity exist about much technique which is still sub judice. But even with this allowance, the marked difference of opinion which is expressed makes it difficult for practitioners to decide first, whether any psychotherapy is useful, and, secondly, whether the suggestionist, persuasionist, or psycho-analytic school is justified in the claims each makes for its own vaunted method.

Difference of opinion must perforce exist on many subjects connected with a profession such as medicine, which is really in its practice an art more than a science. But such direct contradictions as exist on this subject are surely capable of some adjustment, and the object of this letter is to plead, primarily, for a single nomenclature for functional disorders and their treatment. This would seem to be the starting-point for a scheme more acceptable to the bulk of medical psychologists, and hence a better understanding by the general practitioner of the aims and capabilities of the psychotherapist. It is impossible for the busy doctor to make himself conversant with the claims made by

the Viennese and Zurich schools, or to contrast these with the indictments launched by those who still regard the psychoneuroses as mainly or entirely physicogenic. As a result many patients are recommended for a particular variety of psychotherapy who would never be so advised were the limitations of the treatments included under this term more generally understood.

On the other hand, many functional ailments continue to exist under the inadequate attack of drugs, electricity, and massage which could be conquered with ease by a suitable psychotherapeutic procedure. Of these two classes, I am inclined to think that the latter is the larger and more important.

The physico-genic school, to whom psychotherapy is synonymous (certainly in many instances) with moral encouragement and occupation, is imbued with the idea that every medical man can and does practise psychotherapy when he encourages and exhorts his patient, but that beyond this the specialist can do little. Another belief of many is that only "hysterical" or weak-minded individuals are suitable for this method of treatment. In other words, that every person requiring such help must perforce be what has sometimes been dubbed a "degenerate." Every specialist is assumed to have some special knowledge and skill in the practical side of his craft, if only by the constant practice which brings experience in its wake; and we learn to cure by curing, whether we do so by surgical or mental operations. The sole fallacy of this argument might be found in the belief that no especial technique existed for a mental operation, if this belief could be established as a fact. This is, however, far from the truth, as all who have practised psychotherapy know. It matters not whether he believes in the artificial dissociation provided by hypnosis, or the associationistic delving of analysis, the physician who operates on the mind learns that the technique which suits him is the technique which cures his patients. We may assume, therefore, that the experienced psychotherapist has acquired some skill which makes him especially able to treat his patients.

The services which psychotherapy can perform will never be successfully decried by those who can only think in terms of protoplasm; its development is more likely to be delayed by internecine strife and by the bitterness of opposing schools. This letter is a plea for a more uniform nomenclature, for a better understanding of a rational psychotherapy, and for a wider use of the methods included under this term.

I am, Sir, yours faithfully,

IVO GEIKIE COBB.

Queen Anne-street, W., July 14th, 1920.

THE CLINICAL DIAGNOSIS OF DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—I shall be obliged if you will publish this, my final contribution to the discussion, *re* "The Clinical Diagnosis of Diphtheria." Any further correspondence would, I feel, be a waste of time, energy, and paper; for Dr. A. K. Gordon's views differ so widely from my own. What I have published has been an exact record of my personal experience. Dr. Gordon says his experience has been different, and his statement must be accepted as true, though it follows that the clinical features of faucial infections must be different in Manchester from what we see in North Wales.

I am glad to find Dr. Gordon saying (near the end of his letter) that "he holds clinical and bacteriological diagnosis to be equally essential because one supplies the deficiencies of the other." Now, Sir, that is precisely my own view, and I have distinctly stated that I employ both methods. My point is that diphtheria can be diagnosed without bacteriology. Dr. Gordon, I think, takes the opposite view, in spite of the fact that Pierre Bretonneau diagnosed and described diphtheria in 1826, about 57 years before the causative germ was discovered by Klebs (1883), and many years before "germs" were suspected of causing any zymotic disease.

I am, Sir, yours faithfully,

Wrexham, July 16th, 1920. H. DRINKWATER.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE Standing Committee of the House of Commons, to which the Dangerous Drugs Bill has been referred, met on Tuesday, July 13th, and Wednesday, July 14th. The object of the Bill is to carry out the Government's obligation under the Treaty of Versailles to bring the International Opium Convention into force. On both occasions the Committee failed to start work owing to the lack of a quorum. After waiting some time in the hope of a quorum being obtained, the Chairman, Colonel W. G. NICHOLSON, said that the Bill would go to the bottom of the list before the Committee.

HOUSE OF LORDS.

THURSDAY, JULY 15TH.

Veterinary Surgeons' Amendment Bill.

The Veterinary Surgeons' Act (1881) Amendment Bill was read a third time and passed.

HOUSE OF COMMONS.

WEDNESDAY, JULY 14TH.

Typhus Cases in the Black Sea.

Lieutenant-Commander KENWORTHY asked the First Lord of the Admiralty whether His Majesty's seaplane-carrier *Ark Royal* had been used for carrying refugees who were typhus cases in the Black Sea; how many times she had been so used; whether she was disinfected immediately after each voyage; how many cases of typhus there had been among the crew of this ship; how many of the crew had died; and why properly fitted hospital ships were not used for this purpose.—Mr. LONG replied: His Majesty's seaplane-carrier *Ark Royal* was used on one occasion for carrying refugees who were typhus cases in the Black Sea. She was disinfected immediately afterwards. There were 16 cases of typhus fever among the crew in the *Ark Royal*, of whom 8 were landed at Batoum on May 14th last; 5 more landed and sent to the 82nd General Hospital, Constantinople, on May 17th; 1 (Mr. Scott, Warrant Engineer) was also sent to this hospital on May 19th; 1 on May 20th; and 1 on May 27th sent to the 20th Stationary Hospital. Two deaths were reported—namely, Mr. Scott, Warrant Engineer, and Chief Shipwright C. Mattinson. The only hospital ship was not at that time available, and the urgency of evacuation necessitated the use of all available craft.

Cost of Poor-law Relief.

Mr. SWAN asked the Minister of Health if he could state the present average cost of paupers under the Poor-law.—Dr. ADDISON replied: Statistics showing the cost at the present time are not yet available, but in the year 1918–19 the average weekly cost per person in receipt of relief in England and Wales was approximately as follows:—Institutional relief: in infirmaries, 34*s.* 1*d.*; in separate schools and other institutions for children, 18*s.* 2*d.*; in general institutions, 20*s.*; domiciliary relief, 5*s.* 1*d.*

Glasgow Vaccination Statistics.

Mr. ROBERT YOUNG asked the Secretary for Scotland whether he could state what was the total number of small-pox patients admitted to Belvedere Hospital, Glasgow, since the recent outbreak, and of that number how many had been vaccinated in infancy and since, and how many had never been vaccinated; and whether the number of deaths which had taken place were entirely those of vaccinated persons.—Mr. MUNRO replied in a written answer:—

Small-pox in Glasgow to July 12th, 1920.

Age period.	Unvaccinated.		Vaccinated.	
	Cases.	Deaths.	Cases.	Deaths.
Under 10 years	71	16	[illegible]	Nil.
Over 10, under 20	12	4	74	2
Over 20	5	1	182	29
Totals	88	21	264	31

Total cases admitted to Belvedere Hospital 352
Total deaths 52

Of the vaccinated cases 15 have been revaccinated since infancy. Two of these are said to have been revaccinated in 1916, but there is no visible evidence of this.

Third London General Hospital and Tuberculosis.

Mr. GODFREY LOCKER-LAMPSON asked the Minister of Health whether, in view of the treatment urgently required for ex-military and other local tuberculous patients, the

London County Council were desirous of taking over the completely equipped wards in the ground at the back of the 3rd London General Hospital on their vacation by the military authorities at the end of July; whether the London County Council were prevented from doing so by provisions of the Defence of the Realm Act, under which it was obligatory that these huts should then be dismantled and broken up; whether the erection of similar wards elsewhere would cost a sum of not lessthan £150,000; and what action he proposed to take.—Dr. ADDISON replied: I appreciate very fully the importance of preserving these buildings for the treatment of the civilian population, and I am in communication with the London County Council on the subject.

THURSDAY, JULY 15TH.

Health Services Vote.

THE House went into Committee (Sir F. BANBURY in the chair) on a vote of £17,572,797 for the salaries and expenses of the Ministry of Health, including grants and other expenses in connexion with housing, grants to local authorities, &c., sundry contributions and grants in respect of benefits and expenses of administration under the National Insurance (Health) Acts, 1911 to 1919, certain grants in aid, and certain special services arising out of the war.

Dr. ADDISON, Minister of Health, said that this was the first time that the estimates of the Ministry had been presented to the Committee. He referred to the serious loss which the Ministry had suffered in the first year of its work through the death of Sir Robert Morant, who was at all times a loyal and trusted friend, a great servant of the public, and an example to all of self-denying, far-sighted, resolute patriotism. During the year various services had been amalgamated, including those relating to the Health Insurance Department, the Registrar-General, the work of the Board of Education in regard to school medical services and prospective mothers, the work of the Home Office under the Children Act, and a very important branch of the public service which lately came under its purview, the Board of Control dealing with the whole question of lunacy and other minor services. A number of other services foreign to their interests, particularly railways, roads, bridges, and locomotives, and libraries and museums, had been handed over to other Departments. A great part of the work of the Department had been absorbed during the year in consideration of various aspects of the proposals which would in due time be submitted to Parliament with regard to health services outside the Ministry. It was clear that a sound health policy would require time and patience for its development, and any rash expenditure might be misleading and wasteful. The first essential in any well-defined health policy was the spread of good common information, for the foundation of many of their possibilities was in the home. Any sound system must be based upon the principle of prevention. Hitherto they had not made so much progress in that direction as they might have done. Any proper development of a preventive health service must depend upon an adequate supply of trained persons, and in this respect there was at present in many branches a serious deficiency, which it would take time to remove. Any systematic preventive scheme must offer fairly full facilities for dealing with early disability and have at its service an active prosecution of scientific research. The preventive services developed in this country up to the present, so far as they related to the surroundings of individuals, reached a stage of development beyond that of any other. Our sanitary services were well developed, and it was largely owing to them that the health of the people, many of whom dwelt in most pestilential places, was as good as it was. Speaking of the question of housing, the right honourable gentlemen said that they were now past the final stage in over 200,000 houses, but the tenders had been approved and finally settled in regard to 126,000 houses, the only difficulties being finance and labour. Of the 126,000 houses the contract had been signed and work had been started on the site in respect of 69,887. In addition to this, work had been begun on 70,000 houses, and there were an additional 12,000 where the work had been begun with a subsidy. Over 2000 houses were inhabited and another 5000 or 6000 would be completed in the next month or two. As regards cost, the tender quotation for the same class of house had risen in respect of each house £100 during the last six months. Such a disastrous increase could not go on, and the only way it could be compensated was by a check in the rise in the cost of materials, by getting greater output from labour, and by a national understanding with regard to wages.

Security Against Invasion of Disease.

He was glad to say the sanitary cordon which the Ministry had organised round this country had been remarkably successful in securing it against invasion by disease from other parts of Europe which had threatened at the time of demobilisation. They had arranged with the Treasury, in order to help the Port Sanitary Authorities, to pay 50 per cent. grants towards their expenses. They had had another danger before them last year—namely, the fear that rested on the minds of people that there would be another influenza epidemic such as had such devastating results the year before. In the first quarter of 1919 37,000 people, mostly adults in the prime of life, died of influenza. They did all they could by arrangements with the Foreign Office to be supplied with information from abroad. They organised a number of experts in other departments, and they prepared documents giving such information as they could to encourage the people to protect themselves against the disease. They also provided a great number of doses of a protective vaccine which was used freely, and though, no doubt, he gave offence to those who were not in sympathy with such methods, he thought they were justified in spending money in that way. Similarly they took steps under Sir David Semple to deal with rabies cases. In no disease was it easier to spend money unwisely than in combating tubercle. They had encouraged the development of accommodation in sanatoriums, and had added more than 2000 beds in the last year. In connexion with the sanatoriums, they had provided 1000 places for training the men and there was a grant for each. Unless the system could be one that began at home and ended in re-creating, as far as possible, a useful unit in the community under healthy conditions, it must in many respects be largely wasteful. They had now a dispensary system developed to a certain extent, but no dispensary system would be successful in preventing tubercle and no sanatoriums would wipe out the disease while people had to live crowded in unhealthy dwellings. Inappropriate or insufficient food and bad conditions of life and work were all a part of the tuberculosis problem. There had grown up in some places the village colony conception of what was necessary, and they had one or two standing illustrations, notably in Cambridgeshire, of the very successful application of that principle. Research combined with supervision by one directing authority were needed if they were to have a properly coördinated preventive system. Speaking of venereal disease, Dr. Addison said there was no branch of service in which it was more necessary to have a trained personnel. There had been a substantial increase in the number of persons attending the centres. The total had gone up from 460,000 to 843,000, and the scheme was, so far, only in the beginning. There was a tendency amongst certain protagonists to fall upon one another in regard to the method of dealing with the disease. He exhorted them to fall upon the disease. The war had shown that properly directed efforts could cut short a great number of cases that otherwise would develop into mental deficiency of a permanent kind, and it was necessary clearly to provide that in any future arrangements the authorities should be able to deal with mental cases while they were at an early stage to avoid their being labelled lunatics.

Early Treatment of Mental Disorders.

If a system could be developed for the early treatment of mental disorders many asylums would be unnecessary. To develop the work towards this end post-graduate courses for medical men had been arranged under various authorities, and courses of training for nurses and others for this class of disease were being pushed forward. In no matter was it more important to have trained personnel than in questions affecting the charge of mothers. Hence the importance of maternity and infant welfare homes. It had become clear to him that the thing necessary for success was to have trained personnel at their command in the way of nurses and midwives, &c. Therefore it was arranged last year with the Board of Education to have additional grants for training for health visitors, midwives, &c. That had been taken up very extensively. At present there were 700 midwives under training, and the number of centres where this supervisory work was carried on had increased from 1400 to 1600. The proportion of the population in the country which was now reached by these services increased during the past year from 55 to 61 per cent., a substantial increase on the rural population. Towards the end of the last century and the beginning of this the infant death-rate remained stationary at about 150. It was 154 in 1900 and 154 in 1901. It did not begin to fall until 1906, when it was 132. In 1918 it dropped to 97, and last year it dropped to 89, in spite of the fact that in the last quarter of last year there was the influenza epidemic. The figure for the last three quarters of last year and the first quarter of this year was only 78, or about half what it was 20 years ago. Those children who survived nowadays were better nourished and more likely to be useful members of the community hereafter. He had taken out in full the child death-rate for the five year periods up to 1915—he had not got them for the past five years—and the fall had been from 57 to 37, and it was still falling in the same way. Then he looked to see the result of the medical examination of school children notwithstanding this improvement, which, of course, had not made itself felt sufficiently as yet in the children who went to school. But he had found that, although they were developing medical service as energetically as they could, of the

first 750,000 children examined in the schools last year 40 per cent. were still found to be physically defective. The facilities for treatment had improved, and 69 per cent. of these had received treatment.

Position of the Voluntary Hospitals.

One of the subjects which must be the source of great anxiety was the position of the voluntary hospitals. They had under the Poor-law hospitals numbering more than half the hospitals of the country, and he had arranged to have these surveyed from a medical point of view, because it was necessary that not only should they be fully aware on the financial side of what they were doing, but they required a medical scientific survey of the hospital services which were available now and might be made more available under the Poor-law at the present time. Besides the assistance which had been given to the voluntary hospitals by the King Edward's Fund other proposals were being worked out. Those who, representing the voluntary hospitals, came to the Ministry and discussed the matters with them had, he thought, at first in mind that the Ministry was greedy to take hold of those institutions for some purpose or other of its own. They had enough responsibility in the administration of their services to save them from any temptation of that sort. Many of these institutions were pioneers of efficient service, and it would be a mistake of the first order to seek to interfere with that efficiency. Any scheme which the Ministry put forward would be designed to promote their public utility. In one other matter the Ministry had taken a step which would be recognised as essential—namely, in doing what it could to secure further provision for scientific and medical research, and the Treasury had made a grant for the service of £125,000, compared with less than £60,000 a few years ago. The paltry sum of £70,000, or thereabouts, by which they had increased the expenditure on medical research was a trifle as compared with the results which had already been achieved, and compared with expenditure in other directions which was far from being so fruitful. He had before him a long list, but he would only take two or three instances of the useful work which was being done by the grants given under this head. A grant was made with regard to the prevention of T.N.T. poison, for which they were paying several thousands pounds a week compensation. They only gave a few hundreds out of this research fund for the purpose, but it practically abolished T.N.T. poison. One of the age-long plagues of Egypt would have caused them immense expenditure just now had it not been for the work of research assisted out of this fund. Various grants under different headings were made at different times out of this research fund in connexion with antityphoid work. In the South African War the total strength of the British Army was about 530,000. The average ration strength was 208,000. In that war there were 57,684 cases of typhoid, and 8022 died. In the recent war the total strength of the forces would be under-estimated at 5,000,000, and the ration strength would be under-estimated at 1,200,000. Mainly as a result of research there were only throughout the whole war in the British forces 7423 cases of typhoid and 266 deaths.

More Money Needed for Medical Research.

Lieutenant-Colonel RAW congratulated the right honourable gentleman on the satisfactory and encouraging statement which he had made. There was no question that the general health of the community had undergone an extraordinary improvement during the last 25 years. He was very glad that the right honourable gentleman was asking for more money for medical research, because they felt, having very carefully to consider trying to do their best to eradicate such important diseases as influenza, scarlet fever, measles, and diphtheria, that they did not know sufficient about the causation of these diseases which produced such an enormous death-rate every year. They were all very proud of the voluntary hospitals. They had been the pride of this country and the envy of other countries, but we had now come to a time when these hospitals were unable, through insufficient financial support, to carry on the magnificent work which they had done for the last 300 or 400 years. There was a great class who were entirely overlooked in hospital accommodation, but they did not propose to accept charity, and they resented very much having to apply to the Poor-law. He hoped that the Minister of Health, in framing a broad and wise policy for the treatment of diseases in hospitals—because a great many of them could be treated only in hospitals—would, by combining and retaining the great voluntary hospitals, and in some way associating the great Poor-law infirmaries, many of which were quite empty and not required by Poor-law patients, be enabled to provide a national scheme of hospitals, which would be acceptable and beneficial to the whole nation. He was glad to hear the right honourable gentleman say that they would, at all costs, encourage the voluntary hospitals, and in no way interfere with their efficiency, but he was quite certain that financial support would have to be given to voluntary hospitals by the State if they were to continue the excellent work which they had done for so long. He hoped that the Bradford experiment would be copied, so that hospitals might be provided on a national basis in which the patients would be able to pay for what they received.

In regard to the treatment of mental disorders, what was most required was that there should be facilities for the treatment of those persons afflicted with temporary mental disorder without their being certified as insane. If such a course were pursued, a very large number of people would be saved from drifting into hopeless insanity, and a very large amount of the accommodation in the asylums would not be needed. In this matter he hoped that there would be no association whatever with any lunacy authority, and that treatment would be obtainable in some hospitals totally unconnected with a lunatic asylum. The speech of the right honourable gentleman, with its outline of far-reaching schemes, had fully justified the formation of the Ministry.

Lieutenant-Colonel FREMANTLE joined in the congratulations to the Minister for the statement as to the way in which his Department in the first year after its creation had tackled the problems it had to face.

Progress was reported.

Statistics of Drunkenness in England and Wales.

Mr. HAYDAY asked the Secretary for the Home Department whether he could state what proportion the convictions for drunkenness bore to the population of Carlisle for each of the years 1914 to 1919; and what was the average proportion for all the county boroughs of England and Wales for the same years.—Sir JOHN BAIRD (Under Secretary for Home Affairs) replied: The figures desired are to be found in the Annual Volumes of Licensing Statistics and particularly in column 5 of Comparative Table B in each volume. They are as follows (the figures for the year 1919 being taken from the proof of the volume for that year which is in the press and not yet published):—

Proportion of Convictions for Drunkenness per 10,000 of Estimated Population in Carlisle and all County Boroughs respectively in Each of the Years 1914–19.

Year.	Carlisle.	All county boroughs, including London County.
1914	52·07	73·26
1915	52·45	54·92
1916	180·45	33·33
1917	60·59	19·18
1918	15·15	12·35
1919	12·96	23·75

For the years 1914, 1915, 1916, 1917, and 1918 the proportion to population is based on the estimated population for the middle of the year 1914. For 1919 the proportion is based on the estimated population for the middle of 1918. The estimated population of Carlisle for the middle of 1914 was 52,813; for the middle of 1918 it was 60,188.

Financial Position of the Voluntary Hospitals.

Major GODFREY PALMER asked the Prime Minister whether his attention had been called to the financial condition of the hospitals of the country; whether he was aware that some hospitals, owing to diminution in voluntary subscriptions, were in danger either of having to close entirely or much restrict their work; and whether he would cause immediate steps to be taken to deal with the matter.—Dr. ADDISON (Minister of Health) replied: I have for some time past been giving the most anxious consideration to the future of the voluntary hospitals. The situation in London has been relieved by the recent emergency distribution of £250,000 by the King Edward Fund, and the position of the provincial hospitals is generally less serious than in London. The question of State assistance raises many difficult issues, and I am anxious to avoid any precipitate measures which might prejudice the voluntary principle, to the maintenance of which I attach the greatest importance.

Protection of Young Persons Bill.

Mr. WIGNALL presented a Bill "to make further provision for the protection of persons under the age of 21 years from sexual immorality and from conduct akin thereto or connected therewith and to amend Sections 58 and 59 of the Children Act, 1908." The Bill was read a first time.

MONDAY, JULY 19TH.

Milk Imported from the Continent.

Captain Sir BEVILLE STANIER asked the Minister of Health if he could state what was being done to safeguard the consumers of the milk imported from Denmark and Holland; if the milk was being tested for purity and quality when it reached England; and were the farms inspected which produced the milk by their respective Governments.—Dr.

ADDISON replied: I understand that a few experimental consignments of sterilised milk were imported from Denmark in the earlier part of the year, but that the undertaking proved unremunerative. I have no information of milk imported from Holland, but in either case consignments would be subject to examination at the port of entry under the Unsound Food Regulations. Samples of the Danish milk have also been examined at the Ministry of Health. There is, I believe, a system of municipal inspection of dairy farms in Denmark and Holland.

Insurance of Agricultural Workers.

Captain REGINALD TERRELL asked the Minister of Health if he would state what had been the cost per cent. of the receipts from contributions of the working of the National Health Insurance scheme; what proportion in each case applied to workers engaged in agriculture; and the amount in the last year for which figures were available of claims paid to, and the contributions of, agricultural workers under the scheme.—Dr. ADDISON replied: With regard to the first part of the question, the question of working the National Health Insurance scheme by the general body of Approved Societies represents on the average about 12 per cent. With regard to the second and third parts of the question, the Department is not in possession of statistics as to the particulars asked for, whether in the case of agricultural workers or workers in other industries. The records required from the Approved Societies under National Health Insurance do not afford the desired information, because those bodies are not organised according to occupation.

Civilian Doctors and Income-tax.

Captain ELLIOT asked the Chancellor of the Exchequer if he would state why women doctors who were serving at home on whole-time contracts, but were told off to attend female units such as Queen Mary's Army Auxiliary Corps, had been refused the income-tax concession which was granted to other persons who were doing work of a military character; and if he would take the necessary steps to see that the matter shall be adjusted.—Mr. CHAMBERLAIN replied: Civilian doctors, whether men or women, detailed to attend units such as Queen Mary's Army Auxiliary Corps in this country cannot be regarded as entitled to the income-tax reliefs, which under Section 42 of the Income-tax Act, 1918, were allowed to sailors, soldiers, and others, who performed service of a naval or military character in connexion with the war.

Medical News.

UNIVERSITY OF OXFORD.—At examinations held recently the following candidates were successful:—

D.M.—F. L. Apperly, Lincoln (in absentiâ).
M.S.—N. A. Sprott, Christ Church.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful:—

DEGREE OF B.SC. IN PUBLIC HEALTH.

E. N. Ramsbottom, M.B., Ch.B.

DIPLOMA IN PUBLIC HEALTH.

Part II.—William Ash, M.B., B.S.; Sybil Bailey, M.B., Ch.B.; J. C. Beckitt, M.R.C.S., L.R.C.P.; Hilda K. Brade-Birke, M.B., Ch.B.; J. P. Charnock, M.B., Ch.B.; W. J. McIvor, M.B., Ch.B.; C. G. Magee, L.R.C.P.; Kathleen O'Donnell, M.B., Ch.B.; W. J. A. Quine, M.B., B.S.; Arnold Renshaw, M.D.; and L. S. Robertson, M.B., Ch.B.

UNIVERSITY OF BRISTOL.—At the examination held recently for the degree of M.D. the following candidate was successful:—

Oliver Charles Minty Davis, D.Sc., M.B., Ch.B.

UNIVERSITY OF GLASGOW.—The following degrees were conferred on July 19th:—

DOCTOR OF MEDICINE (M.D.).

James Gordon Wilson, M.B., Ch.B. (with commendation); Albert Barnes Hughes, M.B., C.M.; Donald MacKenzie MacRae, M.B., C.M.; and John Young, M.B., Ch.B.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (M.B., CH.B.)

With Honours.—Jonn Wyllie and James Lorimer Halliday.
With Commendation.—William John Ferguson, Robert Dick Gillespie, John Lang Anderson, Helen Frances Wingate, Archibald Gordon Smith, Elsie Florence Farquharson, Margaret Longwill Johnston, William John Payne, and Gilbert Paterson.
Ordinary Degrees.—Marion Bell Armstrong, James Baird, Annie Barlow, Lillias Elizabeth Barr Buchanan, Alister Campbell, James Gibson Campbell, Edith Chalmers, James Livingstone Cowan, Edith Margaret Davidson, Simonne Denil (Mrs. Thompson), Christian Melville Fleming, John Frew, Robert MacInnes Gardner, James Alexander Moore Hall, Jack Hurwich, Elizabeth Smith Inglis, Isabel Edgar Russell Jeffrey, Anna Taylor Kellock, William Malcolm Knox, John Lavelle, Jane Carrick MacDonald, Robert MacKintosh M'Kean, Alexandrena Miller Maclennan, Peter M'Luskie, Joseph Patrick M'Millan, Peter Macmurray, Charles Melville, Janet Dick Montgomery, James Orr, James Paterson, Tejendra Nath Ray, Wilfrid Henry Scott, James Smart, David Croydon Smith, Mary Steven, Margaret Mavor Stuart, Helen Bruce Sutherland, James Nisbet Tennent, Jonathan Robson Turner, Mary Carswell Walker, Daniel May Watson, Mary Lyle Wilson, and Agnes Hart More Young.

QUEEN'S UNIVERSITY OF BELFAST.—Graduation day was on July 16th, when the following degrees in Medicine were conferred:—

M.D.—Edwin G. B. Calvert (gold medal), Edward B. C. Mayrs (gold medal), Robert Marshall (with distinction), Francis C. Carson, Robert M. Fraser, David Jamison, William S. Lloyd, Alexander M'D. M'Mullan, Abraham Porter, R. Lindsay Rea, and Edith Robinson.
M.Ch.—Henry P. Hall (gold medal), Henry P. Malcolm, George R. B. Purce, and R. Lindsay Rea.
M.B., B.Ch., B.A.O.—With Honours: Second Class: Frederick M. B. Allen, Victor M. Allison, Francis J. Boyd, Cawthorne L. Broomhead, R. Leslie Dodds, James S. J. Lee, James P. Martin, and Thomas G. W. Sloan.
Pass: John Alexander, Marion C. Alexander, Joseph F. Blaine, Crawford Blair, James S. Briggs, William Caithness, Robert J. E. Christie, Henry E. Coulter, Charles D. Crawford, William E. D. Crawford, Alexander Cromie, William F. Donaghy, John S. Dudgeon, John H. Dunn, Isaac Eban, Abraham H. Elliott, Patrick J. Flood, Thomas Gilfillan, Winifred E. Hadden, George Haddick, Patrick J. Honan, Thomas J. Hull, Lydia N. Humphries, Richard H. Hunter, Thomas R. V. Irwin, James W. Kernohan, Sydney W. T. Lee, Daniel V. M'Caughan, Phillip J. M'Garry, Henry M'Neill, Eveline F. Magee, Joseph Meban, Horatio N. Middleton, Elizabeth Michael, Phillip F. Mooney, Edward Moore, Helen M. Murnane, Joseph P. O'Kane, James J. M'C. O'Reilly, Joseph Reynolds, Samuel J. Stewart, George B. T. Story, William Verner, and James B. Wiley.
Diploma in Public Health.—Samuel Acheson, George Chesney, William Graham, James A. Harbison, George D. M'Iver, Thomas B. M'Kee, Herbert M'Master, James C. M'Millan, Robert C. M'Millan, Vincent Magee, George W. Rea, and Alexander M'M. W. Sergerdal.

There are now over 1100 students at the University, by far the largest faculty being the medical. The executive committee of the Better Equipment Fund has decided to sell the ground at New Forge, Belfast, and to give the proceeds of the sale to the University for acquiring a more suitable athletic field. The Cherryvale estate in the Newtownbreda district (where there is also an excellent dwelling-house which can be made a pavilion) has been bought for the sum of £20,000, and with alterations it can be made a good playing ground for football and cricket. The Senate at their last meeting (July 14th) appointed a committee to consider the question of the matriculations for entrance into the various faculties, the number of students in attendance at the faculties, and the number of those proceeding to an honours course. The committee was empowered to receive evidence from, or confer with, any body or any individual, either inside or outside the University, and to report to the Senate the result of the investigations.

Dr. Harvey Bateman, of Blackheath, has received from the King of the Belgians the Médaille du Roi Albert "avec rayure" in recognition of valued services rendered to the Belgian cause during the war.

Dr. F. W. Edridge-Green has been appointed a special examiner in colour-vision and eyesight by the Board of Trade.

Mr. Henry Kimpton announces the publication of the eighth edition of Dr. Hobart Amory Hare's "Diagnosis of Disease."

MIDDLESEX HOSPITAL NURSES' HOME.—The new home for nurses of the Middlesex Hospital, opened at Nos. 74, 76, 78, and 80, Gower-street, by Princess Alice on July 8th, is one of the best of its kind in London. Of the £13,000 required the sum of £8000 has been already collected, leaving £5000 to be raised to complete the equipment of this and of the other two homes for Middlesex nurses.

NATIONAL HOSPITAL, QUEEN-SQUARE.—Although several wards of the hospital have been closed through lack of funds, the whole of the out-patient department is working as usual.

GLASGOW ROYAL INFIRMARY: POST-GRADUATE CLASSES.—During the month of September a very complete course of post-graduate teaching will be conducted by the staff of this institution. Full details as to classes and emoluments are given in the advertisement columns.

1ST SCOTTISH GENERAL (TERRITORIAL) HOSPITAL: COMPENSATION FOR DAMAGE.—For damage done to Oldmill Poorhouse (late 1st Scottish General Hospital), caused by military occupation during the war, the Aberdeen Parish Council entered a claim against the War Office for £15,972. Lieutenant-Colonel Martin Cowan, valuator for the War Office, has assessed the damage at £12,606, and the Poorhouse Committee has recommended the Council to accept this sum. There is an additional £554 which has been transferred to another account, of which the Committee hope to receive payment.

Dr. C. Muthu, chief physician of the Mendip Hills Sanatorium, was entertained by old patients at dinner on July 16th in recognition of his completion of 21 years of sanatorium work. A presentation was made of an antique silver inkstand.

PAYING PATIENTS AT THE ROYAL PORTSMOUTH HOSPITAL.—At a meeting held on July 16th the committee decided to require payment, after August 1st, of 15*s*. per week for each adult in-patient and 7*s*. per week for those under 14 years of age, to cover the cost of maintenance. For those who are not in a position to pay these sums the committee will exercise its discretion and reduce the charge or waive it altogether. There is now an overdraft at the bank of £8500, which means a drain of about £10 per week on the income.

EDINBURGH UNIVERSITY EXTENSION.—On July 6th the foundation-stone of the most recent extension of Edinburgh University was laid by the King. The buildings, situated on the south side of the city near Blackford Hill, are to be known as the "King's Buildings," and that portion at present in course of erection is to be used for the accommodation of the chemistry department. The King and Queen, with Princess Mary, were received by the principal, Sir Alfred Ewing. After signing the University Album the King inspected the plans of the building and declared the foundation-stone to be well and truly laid. The Queen was then presented for the degree of Doctor of Laws.

SUMMER SCHOOL OF EUGENICS AND CIVICS.—The Eugenics Education Society is organising a summer school, dealing with the co-relation of eugenics and citizenship, at Herne Bay College, from Saturday, July 31st, to Saturday, August 14th. The inaugural address will be given by Professor Arthur Dendy, F.R.S., entitled "Evolution in Human Progress." Other evening public lectures include "The Press and Right Citizenship" and "The Treatment of Crime from a National Standpoint." The curriculum is arranged to deal with the problems of heredity, biology, and social psychology as they affect the lives of citizens in the present century. Among the lecturers are Dr. W. A. Potts (medical officer to the Birmingham Committee for the Care of the Mentally Defective), Mr. E. B. Turner, Dr. Otto May, and Dr. C. W. Ponder. The secretary of the school, Miss Constance Brown, may be addressed until July 30th at 11, Lincoln's Inn Fields, London, W.C. 2, after that at Herne Bay College, Kent.

SCHEME FOR A CENTRAL HOSPITAL IN ABERDEEN.—The scheme for centralisation on one site of the Aberdeen hospitals was advanced a stage further at a conference of the various public bodies interested in the proposal, which was held at the Town Hall on July 15th under the presidency of Lord Provost Meff. General approval was given to the scheme outlined by the Medico-Chirurgical Society, and it was resolved to appoint an executive committee for the purpose of inquiring into details and preparing an approved scheme for consideration at a subsequent conference. The executive committee consists of four representatives of each of the five bodies—the Medico-Chirurgical Society, the Royal Hospital for Sick Children, the Royal Infirmary, the University of Aberdeen, and the Town Council, along with Professor Matthew Hay, with powers to co-opt additional members. At a previous conference held on April 20th it was explained that the Medico-Chirurgical Society were of opinion that the requirements of the different hospitals could best be supplied by the provision of a common site, and that this would require to be sufficient for the needs of these institutions for the next 50 years. In the case of the Infirmary 500 to 600 beds would be required, and for the Sick Children's Hospital 150 to 200 beds. The departments of the University most closely associated with clinical work, such as those of medicine, surgery, bacteriology, and bio-chemistry, possibly the Incurable Hospital and the Ophthalmic Institution, would also be accommodated and provision made for the treatment of early mental cases and military patients. A dental school and a hostel for senior students might also be included. The advantages claimed for such a scheme are economy in management, more efficient service, combined training for nurses, up-to-date equipment, closer relations between the institutions concerned and the University, and possible post-graduate teaching.

THE DEATH OF SIR ALEXANDER DEMPSEY, M.D., J.P.—The death of a well-known and justly popular member of the medical profession, Sir Alexander Dempsey, occurred on July 18th. A county Antrim man, he was born in 1852, at Coldagh, Ballymoney, a son of the late Mr. Bernard Dempsey and a member of an able family. As a boy he was educated at St. Malachy's College, Belfast, and as a student he went to Queen's College, Galway, and to the Roman Catholic University Medical School, Dublin, graduating M.D. of the Royal University of Ireland in 1874 and L.R.C.S.I. in the same year. He subsequently became a Fellow of the Royal College of Surgeons in Ireland. Immediately after graduating he started practice in Belfast, and made rapid headway in his profession, until at the time of his decease he was the principal Catholic doctor in Belfast and the north of Ireland. He took a great part in establishing the British Medical Association in Ulster, of which he was one of the first secretaries. He was an ex-President of the North of Ireland branch of the British Medical Association and of the Ulster Medical Society. In the erection and extension of the Mater Infirmorum Hospital he took the deepest interest, and at the time of his death he was consulting physician and acting gynæcologist to that institution. He was a member of the governing body of University College, Dublin, and an extern examiner in midwifery and gynæcology in the National University, of the Senate of which he was for a time a member. For the past two years he had been a member of the Senate of Queen's University, Belfast, and on several occasions he had held the office of university clinical lecturer in the Belfast School of Medicine. He was a Fellow of the Royal Society of Medicine and of the Royal Academy of Medicine in Ireland. In 1880 he was appointed a justice of the peace for Belfast, and in 1911 he was knighted. A man of great native shrewdness and of a most genial temperament, Sir Alexander Dempsey was a very hard worker and a most excellent medical opinion. He is survived by two sons, one a doctor, the other a member of the Irish Bar, and four daughters. His wife predeceased him. After a Requiem Mass at Holy Family Church, Newington-avenue, Belfast, on July 20th, he was interred in Milltown Cemetery, an immense number of friends and medical confrères being present.

LISTER MEMORIAL FUND.—At a public meeting held at the Mansion House in October, 1912, the following proposals for commemorating the work of Lord Lister were adopted:—

The placing of a memorial in Westminster Abbey, to take the form of a tablet with medallion and inscription.

The erection of a monument in a public place in London.

The establishment of an International Lister Memorial Fund for the advancement of surgery, from which either grants in aid of researches bearing on surgery or awards in recognition of distinguished contributions to surgical science should be made irrespective of nationality.

A meeting of the General Committee was held in the rooms of the Royal Society on July 19th last to receive and adopt the report of the Executive Committee appointed in 1912. The chairman, Sir Archibald Geikie, stated that the sums received in respect of subscriptions from the British Empire and foreign countries amounted to £11,846 5*s*. 10*d*. Expenses incurred in printing, stationery, postage, advertising, &c., amounted to £390. The report stated that delay had necessarily occurred in carrying out all the proposals adopted at the Mansion House meeting, but that a memorial tablet, executed by Sir Thomas Brock, had been unveiled in Westminster Abbey on Nov. 1st, 1915, and steps were being taken for the erection of a monument in a public place in London.

In order to carry out the scheme for the establishment of the International Lister Memorial Fund for the Advancement of Surgery the following proposals were adopted:—

(*a*) That out of the General Fund a sum of £500, together with a bronze medal, be awarded every three years, irrespective of nationality, in recognition of distinguished contributions to surgical science, the recipient being required to give an address in London under the auspices of the Royal College of Surgeons of England.

(*b*) That the award be made by a Committee constituted as follows: Two members nominated by the Royal Society, two members nominated by the Royal College of Surgeons of England, one member nominated by the Royal College of Surgeons in Ireland, one member nominated by the University of Edinburgh, one member nominated by the University of Glasgow.

(*c*) That any surplus income of the General Fund, after providing for the erection of a monument, and after defraying administrative expenses, be either devoted to the furtherance of surgical science by means of grants, or be invested to increase the capital of the Fund.

The continued carrying out of this scheme in future years will require the provision of some permanent and adequate machinery as the Lister Memorial Committee cannot, in view of its constitution, be itself permanent. The Committee, having ascertained that the Royal College of Surgeons of England would be prepared to become the trustees and administrators of the Lister Fund and to carry out its objects, subject to the above provisions of the scheme, authorised the Executive Committee to take such steps as may be necessary to give effect to this arrangement.

The subscription list is still open, and the honorary treasurer of the Fund is Sir W. Watson Cheyne, Bart., of whom donations may be addressed at the Royal Society, Burlington House, London, W. 1.

METROPOLITAN HOSPITAL SUNDAY FUND.—The total of the Hospital Sunday collection up to July 16th was £84,000.

GIFTS TO UNIVERSITIES.—Sir Jesse Boot has given £50,000 to the new Nottingham University scheme, £20,000 being for a chair of chemistry. Alderman Louis Samuel Cohen has given £15,000 to Liverpool University.

THE King of the Belgians has conferred upon Dr. Francis J. Allan, medical officer of health for Westminster, the Médaille du Roi Albert, in recognition of valued services rendered to the Belgian cause during the war.

THE medal of the Most Excellent Order of the British Empire has been conferred upon Dr. J. F. Williams, who is in practice at Camberwell-road, London, "for courage and devotion to duty on the occasion of an air raid in rescuing persons who had been buried in the cellar of a burning building."

A WAR MEMENTO FROM BRITISH TO AMERICAN SURGEONS.—At the suggestion of Sir Berkeley Moynihan, who has worked in collaboration with Sir Anthony Bowlby and Sir D'Arcy Power, a silver-gilt mace is to be presented to the American College of Surgeons (which includes Canada) as a memento of the work done in coöperation by American and British surgeons during the war. The mace is the work of Mr. Omar Ramsden, a well-known art metal worker, who has modelled the head of the mace on the lines of a surgeon's mortar dug up in a Salonika trench. The design includes maple leaves and American eagles, the badges of the British and American Army Medical Corps, and the serpents of Æsculapius, while the name is introduced of Philip Syng Physick (1768–1837), the father of American surgery, who was a pupil of John Hunter and an ex-house surgeon at St. George's Hospital. An inscription reads: "From the consulting surgeons of the British Armies to the American College of Surgeons in memory of mutual work and good fellowship in the Great War." The mace will be on view for a month at the Exhibition of Industrial Art, 217, Knightsbridge, S.W.

THE PHYSICS AND CHEMISTRY OF COLLOIDS.—The Faraday Society and the Physical Society of London are arranging to have a joint symposium and general discussion on this important subject next October. The subject will be introduced by a brief survey of the present position of colloidal physics and chemistry, and discussion will then arise on the following subdivisions of the subject: Emulsions and Emulsification; Physical Properties of Elastic Gels; Cataphoresis and Electro-endosmose; Precipitation in Disperse Systems; Glass and Pyrosols; Non-aqueous Systems. It is remarked that in spite of the importance of colloidal physics and chemistry in many branches of manufacture, and of the interest which the subject has aroused in recent years, much light remains to be thrown on the nature of the manufacturing processes in which colloids play a part. It is hoped that the discussion will focus attention on some of these problems, and that its result will be to indicate lines of advance and suggest further researches, and that it will be fruitful not only in helping to a fuller understanding of the laws of the colloidal state, but also in suggesting new applications for colloids in the laboratory and in the works. The exact date and place of meeting and further particulars will be announced later. In the meantime anyone desirous of using the opportunity of the discussion to bring forward experimental matter or theoretical considerations bearing on the above-mentioned branches of the subject is asked to communicate, as soon as possible, with the secretary of the Joint Committee, 10, Essex-street, London, W.C. 2.

Communications, Letters, &c., to the Editor have been received from—

A.—Dr. E. D. Adrian, Cambridge.
B.—British Olympic Association; The Successors of F. Bohn, Haarlem; Mrs. C. Brereton, Lond.; Sir John Rose Bradford, Lond.
C.—Chadwick Trust, Sec. of; Dr. I. G. Cobb, Lond.; Dr. C. Chidell, Folkestone; Canadian Pacific Ocean Services, Lond.; Dr. F. G. Crookshank, Lond.; Dr. H. P. Cholmeley, Forest Row; Dr. N. Crichlow, Tulagi, British Solomon Islands.
D.—Dr. L. S. Dudgeon, Lond.; Dr. H. Drinkwater, Wrexham; Sir F. Danson, Lond.; Dr. F. W. F. Day, Ipoh; Prof. H. B. Day, Sandwich; Prof. S. Delépine, Manchester.
E.—Dr. J. W. Edington, Hythe; Edinburgh Anti-Opium Committee; Dr. F. W. Edridge-Green, Lond.
F.—Dr. Z. P. Fernandez, Leeds; Dr. G. L. K. Finlay, Lond.
G.—Dr. N. Gray, Newmarket; Dr. K. Gengnagel, Frankfort-on-Main.
H.—Home Office, Lond.; Major W. E. Home, R.A.M.C.; R. H. Heward Co., Lond.; Mrs. M. Hogarth, Lond.; Prof. W. Hall, Bristol.
I.—Insurance Committee for the County of London; Dr. H. Ingleby, Lond.
J.—Mr. W. B. Jepson, Lond.; Dr. G. G. Johnstone, Lond.; Dr. L. Jones, Merthyr Tydfil; Dr. C. O. Jones, New Brighton.
K.—Prof. A. F. S. Kent, Manchester; Dr. R. Knox, Lond.
L.—Dr. A. Loxton, Birmingham; Mr. H. K. Lewis, Lond.; Dr. H. Long, Lond.; Dr. C. E. Lakin, Lond.; Lt.-Col. P. S. Lelean, Lond., Dr. C. Lillingston, Gorleston-on-Sea; Dr. G. C. Low, Lond.; London County Council, Clerk of.
M.—Dr. Kathleen McKeown; Metropolitan Hospital Sunday Fund, Lond.; Dr. H. C. Miller, Lond.; Dr. R. W. McKenna, Liverpool; Mrs. M. McConnel; Dr. J. E. R. McDonagh, Lond.
N.—National Hospital for the Paralysed and Epileptic, Lond., Sec. of.
O.—Dr. R. A. O'Brien, Lond.; Dr. T. Orr, Lond.
P.—Sir D'Arcy Power, Lond.; Physical Society of London; Dr. J. Pirie, Leamington; Mr. T. H. Pear, Manchester; Dr. T. Paul, Janipur; Col. A. G. Phear, Lond.
R.—Dr. J. D. Rolleston, Lond.; Dr. J. E. H. Roberts, Lond.; Rockefeller Institute for Medical Research, New York; Royal College of Physicians, Edinburgh.
S.—Sir E. A. Schafer, Edinburgh; Prof. W. Stirling, Manchester; Dr. J. H. Sequeira, Lond.; Dr. T. H. G. Shore, Padstow; Dr. L. E. Shore, Cambridge; Dr. F. J. Scrimgeour, Nazareth.
T.—Dr. A. T. Taylor, Liberton; Mr. A. R. Thompson, Lond.; Dr. J. Tatham, Oxted; Sir StClair Thomson, Lond.; Dr. E. T. Thompson, Lond.
U.—University of Manchester; University of Glasgow.
W.—Dr. H. H. Woodcock, Walton-on-Thames; West London Hospital Post-Graduate College, Sec. of; Dr. K. M. Walker, Lond.

Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE.
MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.
A Course of Twelve Lectures on Neurology, open to Students and Graduates of the London Hospital and other Schools—
TUESDAY, July 27th.—2 P.M., Lecture V.:—Dr. Riddoch: Disorder of Sensibility from Lesions of the Spinal Cord and Peripheral Nerves.
WEDNESDAY.—2 P.M., Lecture VI.:—Dr. Thompson: Sensory Disturbances of Spinal Origin.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, July 26th.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
TUESDAY.—2.30 P.M., Mr. T. Gray: Operations. 2.30 P.M., Mr. Addison: Visit to Surgical Wards.
WEDNESDAY.—2. P.M., Mr. Addison: Operations. 2 P.M., Mr. D. Armour: Visit to Surgical Wards.
THURSDAY.—2 P.M., Mr. D. Armour: Operations. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.
FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 2.30 P.M., Mr. T. Gray: Operations.
Daily:—10 A.M., Ward Visits. 2 P.M., In-patient Clinics and Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, July 26th—10.30 A.M., Mr. H. Evans: Diseases of the Urethra. 11.45 A.M., Dr. Banister: Malignant Disease of the Uterus. 2 P.M., Dr. Sundell: Chronic Pleurisy in Children. 4.30 P.M., Lecture:—Dr. Banister: Medico-legal Bearings of Gynæcological Practice.
TUESDAY.—10.30 A.M., Mr. Benians: Urine Analysis. 11.45 A.M., Mr. N. Fleming: Ophthalmoscopic Examination. 2 P.M., Mr. Hayton: Diseases of Accessory Sinuses of Nose. 4.30 P.M. Lecture:—Lt.-Col. R. H. Elliot: Affections of Eye due to Tropical Disease as seen in this Country since the War.
WEDNESDAY.—10.30 A.M., Dr. Alexander: Examination of Gastric Contents. 11.45 A.M., Mr. Carson: After-Treatment of Abdominal Operations (with complications). 2 P.M., Dr. M. Bahr: Cases of Tropical Disease as Occurring at Home. 4.30 P.M., Lecture:—Mr. J. W. T. Walker: A New Method of Prostatectomy and the Reasons for its Adoption.
THURSDAY.—10.30 A.M., Mr. Hayton: Otological Examination. 11.45 A.M., Mr. Gillespie: Surgical Pathology of Appendicitis and its Bearing on Treatment. 2 P.M., Dr. Metcalfe: Treatment by Ionic Medication. 4.30 P.M., Consultations (Surgical).
FRIDAY.—10.30 A.M., Mr. Benians: Puncture Fluids. 11.45 A.M., Mr. Gillespie: The Application of Plaster-of-Paris in Joint Conditions. 2 P.M., Dr. Alexander: Differential Diagnosis of Dyspeptic Conditions. 4.30 P.M., Lecture:—Mr. Carson: Diagnosis of Tumours of Great Intestine.
SATURDAY.—11 A.M., Dr. F. Thomson (at the N.E. Fever Hospital, St. Ann's-road, N.): Cases Illustrating the Early Diagnosis of Infectious Fevers.
Each Day:—3-4 P.M., General Hospital Practice.

MALE LOCK HOSPITAL, Dean-street, W.
MONDAY, July 26th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

CANCER HOSPITAL, Fulham-road, S.W.
Clinical Lectures on the Diagnosis and Treatment of Cancer.
TUESDAY, July 27th.—4.30 P.M., Mr. C. Rowntree: Cancer of the Breast.
FRIDAY.—4.30 P.M., Dr. H. Robinson: Anæsthetics in Cancer Cases.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street (behind Whitworth Park).
THURSDAY, July 29th.—4.30 P.M., Dr. A. C. Magian: Chronic Uterine Complaints.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

DEVONALD, A., Captain, R.A.M.C. (T.F.), has been appointed Regimental Medical Officer to 4th Batt., K.S.L.I. (T.), and Medical Referee for Bridgnorth and District under the Ministry of Pensions.

GILMOUR, A., M.D. Edin., Medical Officer of Health and School Medical Officer of Hindley, Lancashire.

LAWSON, Dr., Medical Officer of Schools under the Bradford Education Committee.

Certifying Surgeons under the Factory and Workshop Acts: ROGERS, C. D., M.B., Ch.B. Edin. (Ellesmere); JONES, W. M., L.R.C.P. & S. Irel. (Llanfaircaereinion); ROBERTS, E. S., L.R.C.P. Lond., M.R.C.S. (Penygroes); MCLEAN, J. A., M.B., Ch.B. Glasg. (Buckhaven); KEAN, J., L.R.C.P. & S. Edin., L.F.P.S.G. (Forkhill); FYFE, W. W., M.D. Glasg. (Johnstone); BAMFORD, T., L.R.C.P. Lond., M.R.C.S. (Uttoxeter); FLOOD, J. W., M.B., B.Ch. Dub. (Liverpool, Central).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen University.—Lecturer in Bacteriology. £500. Also Asst. in Path.
Bath, Royal United Hospital.—H.P. £150.
Birkenhead Borough Hospital.—Jun. H.S. £200.
Birmingham General Hospital.—H.P., H.S., and Cas. H.S. £100.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £150.
Bolton Infirmary and Dispensary.—Female Sen. H.S. £300.
Bradford City Hospital, Leeds-road.—Asst. M.O. £350.
Bradford Royal Eye and Ear Hospital.—Aural S.
Bristol General Hospital.—P. and Asst. P.
Bristol Royal Infirmary.—Act. Hon. Asst. Obst. P. Also Res. Locum Tenens. 5 gs. a week.
Cardiff City Mental Hospital, Whitchurch, near Cardiff.—Sen. Asst. M.O. £550.
Cardiff, King Edward VII.'s Hospital.—H.S.'s. £200.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—Res. M.O. £250. Also H.P. £100.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Croydon General Hospital.—Jun. H.S. £150.
Derby, Derbyshire Education Committee.—School M.O.'s. £550.
Dorchester, Dorset County Council.—Asst. County M.O. £500.
Dumfries and Galloway Royal Infirmary.—Res. H.S.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. £175.
Halifax County Borough.—Female M.O. for Maternity and Child Welfare Clinics. £500.
Hereford County and City Mental Hospital.—Jun. Asst. M.O. £350.
Hove, Carr-Burton Memorial Hospital, Sackville-road.—Res. M.O. £250.
Huddersfield Royal Infirmary.—Sen. H.S. £250.
Huddersfield, Storthes Hall Asylum, Kirkburton.—Sen. Asst. M.O. £500.
Hull Royal Infirmary.—Asst. H.S. £150.
Johannesburg, South African Institute for Medical Research.—Asst. Bacteriologist. £800.
Leeds, City of.—Asst. M.O. for Maternity and Child Welfare. £500.
Leeds City Tuberculosis Sanatorium, Killingbeck.—Res. Asst. M.O. £300.
Leeds General Infirmary.—Res. Surg. O. £200.
Leith Hospital.—H.S. and H.P. £100.
London Temperance Hospital, Hampstead-road, N.W.—Asst. Res. M.O. £120.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Manchester, Baguley Sanatorium for Tuberculosis.—Third Asst. Res. M.O. £300.
Manchester, City of.—M.O. £450 and war bonus of £307 15*s.* 6*d.*
Manchester, Monsall Fever Hospital.—Sec. Med. Asst. and Third Med. Asst. £300 each.
Manchester Royal Infirmary, Roby-street, Manchester.—Res. M.O. £200. Also H.P. £50 and £100.
Manchester Royal Infirmary.—Asst. Director, Clin. Lab. £300.
Miller General Hospital for South-East London, Greenwich, S.E.—Res. Cas. O. £150. Also H.S. £100.
Ministry of Pensions Hospital, Denmark-hill.—Visit. S. and Visit. P.
Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. Res. M.O. £200.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Surg.
North St. Pancras School for Mothers, Queen's-crescent, N.W.—M.O. 1½ gs. per consultation.
Nottingham General Hospital.—Res. Cas. O. £300.
Plymouth Education Authority.—Dep. M.O.H. £600.
Plymouth, South Devon and East Cornwall Hospital.—H.P. £140.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Asst. Res. M.O. £60.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Anæsth. £95. Also Path. £300.
Royal Institute of Public Health, Russell-square, W.C.—Sen. Demonstrator of Bacteriology.
Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £250.
St. Bartholomew's Hospital.—S.
St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum, City-road, E.C.—H.S.
St. Thomas's Hospital Medical School, Albert Embankment, S.E.—Demonstrator of Anat. £400.
Sheffield, Children's Hospital, Western Bank.—H.S. £200.
Sheffield, East End Branch of the Children's Hospital.—H.S. £150.
Sheffield Royal Hospital.—Asst. Cas. O. £150.
Sheffield Royal Infirmary.—H.P. £150.
Shoreditch Metropolitan Borough.—Asst. M.O.H. £600.
Southampton, Free Eye Hospital.—Locum Tenens.
South London Hospital for Women, South Side, Clapham Common, S.W.—Female H.S. £100.
Stafford, Staffordshire General Infirmary.—H.S. £250.
Staffordshire Education Committee.—Practitioners under M.O.H. and Sch. M.O. £600.
Swansea General and Eye Hospital.—Jun. H.S. £200.
Taunton and Somerset Hospital.—Sen. and Jun. H.S.'s. £200 and £150 respectively.
Warrington Infirmary and Dispensary.—Jun. H.S. £200.
Windsor, King Edward VII. Hospital.—H.S. £200.
Worcestershire County Council.—Asst. County M.O.'s and Sch. Oculist. £500 each.

The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Yarmouth.

The Home Secretary gives notice that he proposes to appoint two additional Medical Referees under the Workmen's Compensation Act, 1906, for the Sheriffdom of Lanark. Applications for the posts, for which surgical qualifications are required, should be addressed to the Under Secretary for Scotland, Scottish Office, Whitehall, S.W. 1, and should reach him not later than August 7th, 1920.

Births, Marriages, and Deaths.

BIRTHS.

ATTENBOROUGH.—On July 19th, at The Ridges, Farnborough, Hants, the wife of Dr. Wilfrid Attenborough, of a son.

BROWN.—On July 16th, at Welbeck-street, W., the wife of William Brown, M.A., M.D., D.Sc., of a daughter.

CHANDLER.—On July 12th, to Marjorie (*née* Raimes), wife of F. G. Chandler, M.A., M.D. Cantab., M.R.C.P., of 86, Harley-street and 4, Downshire Hill, Hampstead—a daughter.

DUDGEON.—On July 10th, at Cairo, the wife of Captain C. R. Dudgeon, R.A.M.C., of a son.

SHERWOOD.—On July 13th, at Eastbourne, to the wife of Douglas Sherwood, M.B., a son.

TUCKER.—On July 11th, at Park View, Pembury, the wife of S. A. Tucker, M.B., B.S. (late Captain, R.A.M.C.), of a daughter.

VARIAN.—On July 16th, to George Varian, M.D., and Hilda Varian, M.D., Thornborough House, Clarendon-road, Watford, Hertfordshire—a son.

MARRIAGES.

DOWNES—YOUNG.—On July 15th, at Park Church, Helensburgh, A. Drummond Downes, M.D., Ch.B., to Mary Angela Young, daughter of the late James Young and Mrs. Young, Rockmont, Helensburgh.

PENNY—KENWORTHY.—On July 17th, at Hoghton-street Baptist Church, Southport, by the Rev. Charles Brown, D.D. of London, and the Rev. J. A. Smallbone, Dr. Cyril John, youngest son of T. S. Penny, Esq., J.P., of Knowle, Taunton, to Dr. Muriel Mercer, eldest daughter of Dr. and Mrs. Kenworthy, of Kenworthy's Hydropathic, Southport, and Bentley Lodge, Parbold.

ROBINSON—STREDWICK.—On July 15th, at St. Clement Danes, Strand, Harold Shillito Robinson, M.R.C.S., L.R.C.P. Lond., to Vera Emily, only daughter of Mr. and Mrs. C. E. Stredwick, of Denham House, Epsom.

DEATHS.

ADAM.—On July 11th, at Liverpool, Edward Morison Adam, M.R.C.S., L.R.C.P., aged 39.

RHYS GRIFFITHS.—On July 13th, suddenly, Philip Rhys Griffiths, M.B., B.Ch., of Newport-road, Cardiff.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE GIANT NURSERY IN PARIS.—Our Paris Correspondent writes that the proposal for the tranformation into a giant maternity home and creche of the National Asylum at Charenton, noticed in THE LANCET of July 3rd, has met with such objection on the part of alienists that the Ministry of Hygiene has modified its decision. At present 500 mental patients occupy the asylum, which has accommodation for 1500. These 500 will remain in one wing of the vast building, and as they die out—the mortality-rate is admittedly high—their places will not be filled. From now on 1000 beds will be reserved for the Institute of Puericulture, providing accommodation for about that number of recently confined women, who will stay there with their infants for an average of two months. The number of these occupants will gradually increase in proportion as the others disappear.

DONATIONS AND BEQUESTS.—By the will of the late Mr. George Paxton, of Primrose Hill-road, N.W., manufacturing optician, the testator left the following bequests to hospitals, provided that the business relations between Messrs. Currie and Paxton and the hospitals still existed at the date of the will: £250 to the Royal Eye Hospital, St. George's Circus, S.E.; £200 each to the Central London Ophthalmic Hospital, the Western Ophthalmic Hospital, London, and the Bristol Eye Hospital; £150 to the Bristol Eye Dispensary; and £100 each to King's College Hospital, St. Thomas's Hospital, Middlesex Hospital, University College Hospital and the New Hospital for Women, London.

Notes, Short Comments, and Answers to Correspondents.

THE INCIDENCE OF FATAL RHEUMATIC HEART DISEASE IN BRISTOL, 1876–1913.[1]

BY CAREY F. COOMBS, M.D., F.R.C.P. LOND.,
ASSISTANT PHYSICIAN, BRISTOL GENERAL HOSPITAL; HONORARY CONSULTING PHYSICIAN FOR DISEASES OF THE HEART, MINISTRY OF PENSIONS, S.W. REGION.

IN the Annals of the Gloucestershire Medical Society[1] it is stated that on July 29th, 1789, Mr. Edward Jenner "favoured the Society with Remarks on a Disease of the Heart following Acute Rheumatism, illustrated by Dissections." At the same time Dr. David Pitcairn, who was physician to St. Bartholomew's Hospital from 1780 to 1793, was teaching—to quote Sir Norman Moore[2]—"that valvular disease was a frequent result of rheumatic fever." Since their day the cardiac lesions have come to be regarded more and more respectfully, while at the same time it has become clear that the joint lesions, though painful for a time, lead but seldom to any lasting impairment of function. The present-day view is, indeed, that carditis is the disease and polyarthritis one of the complications. To use Sir Norman Moore's[3] words again: "Remembering the unwillingness of men and women to learn that they have diseases associated with the lungs or heart, I feel that 'heart fever,' which would be an appropriate term for a disease of which the most serious feature is endocarditis, would have little chance of coming into use instead of rheumatic fever. Were it not for this difficulty on the side of public opinion ..... the term 'heart fever' might with advantage be adopted for that morbid condition in which endocarditis, transient arthritis, and raised temperature are always present." The instructed point of view, then, is that acute infective pancarditis is a specific disease complicated by polyarthritis, chorea, and so on.

This view is borne out by more minute inquiry into the nature of the disease. When I was a senior student at St. Mary's Hospital Dr. F. J. Poynton and Dr. A. Paine[4] were publishing their papers on the "*Micrococcus rheumaticus*." I was able later[5] to bring support to their views by showing that the tissues react in a certain definite way to the attack of this micro-organism; while in 1912 Dr. R. H. Miller, Dr. E. H. Kettle, and I[6] found that the reactions provoked by experimental inoculation with the micrococcus were similar in essentials to those found in man.

Now, I assume that everyone is agreed upon the vital need for getting rid of rheumatic carditis and its crippling results. This can only be done by discovering first the means by which the organism gains its access to the cardiac tissues. For reasons I gave long ago,[7] reasons apparent to all who study the subject, it seems clear that there is no question of continued reinfection of the host from without; the history of the disease is one of attack after attack, at intervals of months or years, extending over a decade or even more. The organism, therefore, is one that persists in the body for long periods. General considerations lead me to suppose that it is not in the cardiac tissues themselves, but at some point within the body, outside the circulation but with ready access to it, that it lives on from one outbreak to the next. Most likely it is closely related to the cocci that normally live on the mucous surfaces, especially those of the alimentary tract. Thence it passes into some intermediate tissue (probably the lymphoid aggregations), where its virulence is enhanced to the level of pathogenicity. From this in turn it escapes into the blood serum, under conditions predisposing to its increase in virulence, in small but repeated doses, and attacks the heart with irremediable results.

It has therefore seemed to me worth while to try and find out something about the external conditions that predispose to pathogenic action by this micro-organism. With this end in view I set out to explore the incidence of rheumatic heart disease in Bristol, in its relation to time and place. The difficulties of notification are very great, so I did not feel called upon to attack the problem in that way until I had tried a simpler method. Hospital figures, again, are so obviously incomplete as to furnish nothing except what would mislead. It did not seem possible to approach the matter except through the death registers of the city. This was undertaken, therefore, with the aid of a grant from the Research Committee of the University of Bristol Colston Society. I have also had the benefit of much advice from Dr. D. S. Davies, the medical officer of health for Bristol; and the skilled and energetic assistance of his clerk, Mr. W. N. Brown, of whose help I cannot say too much. Indeed, with so much support I feel I ought to have accomplished far more than I have done.

The Method of Investigation Used.

The method adopted was to go through the death registers from 1876 to 1913 inclusive. Deaths from "acute rheumatism" and "rheumatic fever" were noted, also deaths from "rheumatic heart disease," "rheumatic pericarditis," and so on; and after much casting about I decided to include also all deaths from "pericarditis" and "endocarditis" occurring before the age of 25, unless the cause of the lesion was stated to be something other than rheumatic infection. (I chose this age after investigation of the age-incidence of rheumatic infection of the heart from hospital records.) I assume that practically all these deaths are due to the cardiac lesions, even where the certificate does not mention cardiac manifestations.

What I was trying to do was to make a list of deaths from active rheumatic infection of the heart. For the purpose of relating the onset of infection to locality and season it would be useless to include cases of post-rheumatic heart disease, since the course of many of these covers several decades and removes the death far from the time and place at which the infection first began. For the purpose of estimating the number of deaths attributable in each year to rheumatic infection of the heart and its after-effects I made lists for the years 1876, 1886, 1896, and 1906, which included deaths not only from the causes I have named but also from heart disease of all kinds before the age of 40 (excluding congenital lesions and ulcerative endocarditis). Anyone who has examined numbers of cases of cardiac disease post mortem will agree that practically all such cases are of the rheumatic type. Syphilis rarely kills by its cardiac lesions before 40. In these four years I have named, the average annual number of deaths from rheumatic heart disease as I have defined it, in all its stages, was 71 (73, if deaths from chorea be included) in an average population of 251,974. This, I feel sure, is an under-estimate, because many people do not die of post-rheumatic heart disease till after 40, and also because many cases of ulcerative endocarditis (not included in my total of 73) are due in part to a previous rheumatic infection of the valves. And even if the figure were correct for the mortality bills, they render no account of the progressive crippling of activity during the productive decades which is so deplorable a feature of the disease. As it is it seems to me serious enough to think that for every million city dwellers there should be 300 deaths from this disease each year; for I take it that Bristol is no worse off than other British cities in this respect. Curves of death-rate show that the death-rate from rheumatic heart disease is not dropping as sharply as the general death-rate. It is therefore a matter serious enough to justify a searching inquiry.

I am only too aware of my amateurish methods and unsatisfactory data. Before I had gone far into the death registers I saw that these records were not accurate enough to justify any minute deductions, yet it did seem to me that they might, on searching, reveal some features so striking as to give one a lead to further inquiry. I am afraid I cannot claim any very convincing results; but such as they are I bring them forward.

Seasonal Variation of Fatal Rheumatic Carditis.

The first point to which I ask your attention is that fatal rheumatic carditis appears to own a seasonal variation. The incidence is maximal in December and January, minimal in July and September. This corresponds broadly with rheumatic fever curves from the Scandinavian countries (Newsholme[8]). Comparison with charts of average rainfall and mean temperature seems to show some relation between high rheumatic incidence and low rainfall, and also high monthly mean temperature. In order to examine these possibilities in more detail a chart was prepared, by means of which we were able to compare, month by month, the rheumatic incidence with the rainfall and the mean temperature. There were six principal "spikes" upward in the rheumatic curve; in 1877, 1881, 1886, 1893, 1901, and 1911. The first two and the last two coincided with a low rainfall, but there was no clear relation to the temperature curve. Again, on six occasions the monthly rainfall exceeded 7 inches, and each occasion coincided with a low incidence of fatal rheumatic heart disease. Further, a sustained drop in the rainfall appeared to be followed by an increase of fatal carditis. The same fact has already been observed, in regard to rheumatic fever, by Sir A. Newsholme,[9] and on much wider evidence. He explained it by saying that scanty rainfall caused a warm and dry subsoil, usually with an exceptionally low ground water. But a similar examination of the temperature curve fails to prove that it had any definite relation to the rheumatic incidence.

Geographical and Geological Inquiries.

The possible effect of locality was explored by marking the houses in which a death from rheumatic infection had occurred with a dot for each house, on a map of Bristol

[1] Read to the Thirty-first Congress of the Royal Sanitary Institute at Birmingham.

coloured to show the various geological formations. A street index of the deaths was also prepared. It must be confessed that neither of these plans brought to light anything definite. No epidemic was discovered, unless one takes note of a group of eight cases occurring within seven weeks (November and December, 1893) in a small area in the south-west centre of Bristol. During the same period only one other death was noted in the whole of the rest of the city. A search for "rheumatic houses" was fruitless. Only 11 houses were found in which more than one death from rheumatic infection had occurred; and in none of these had there been more than two such deaths. Moreover, in these instances examination of the facts did not warrant any belief in the house as a factor in the causation of the disease.

The map shows no relation between the geology of the city and the rheumatic incidence. Neither does it support the view that this disease is particularly fond of river valleys. The banks of the Avon and the Frome, with their ramifications, are not studded with dots in the map.

There are four areas in the city where 19, 20, or 21 dots are to be found within a square, the side of which is one-quarter mile in length. There is nothing in common between these areas except that they are all of them crowded with inhabitants. One of them is low down on a river bank, another is raised a little way above the river level by a sharp slope, a third is on one of the sharp inclines that rise steeply from the centre of the city, and the fourth is on the edge of Durdham Downs, on the upper limestone. As to density of population, it does not seem to me possible to prove that the high incidence of fatal rheumatic heart disease in these areas means anything more than that where more people live there also more people die. I have tried to find some relation between the incidence of carditis and the density of population by comparing the ascertained densities of the various registration areas with the rheumatic death-rates in those areas, but no such relation can be discovered.

Suggestions for Further Investigations.

Yet there is one last point of some significance. When he was preparing the charts Mr. Brown pointed out to me that the extensions of the city in 1897 and 1904 did not add much to the total numbers of deaths from rheumatic infection. Indeed, when we examine the curve of rheumatic death-rate we find that these inclusions coincided with a drop in the rate. When outer areas were added to the relatively congested centre a fall in the rheumatic death-rate took place. Is it not probable that the explanation may lie in the relatively rural and uncrowded character of the areas brought in? I think this is a possibility well worthy of exploration. This leads me to conclude with a brief outline of plans for further research. The present inquiry shows that rheumatic infection of the heart is killing 70 or 80 people every year in Bristol, to say nothing of the decade or more of lessened efficiency that precedes a majority of those deaths. The mortality figures, imperfect though they are, do not point to any great natural fall in the incidence of this disease. They show that when the city has been "countrified" by inclusion of partially rural areas the death-rate from this disease has fallen. The winter rise in its seasonal curve is at the most only partially explained by reference to climatic conditions. Is it not possible that there is an economic factor in the causation of this infection?

To put such a question is one thing; to answer it is another. But it does appear to me that we ought to try. Data as to the incidence of rheumatic carditis must be collected from an area wide enough to include rural as well as urban districts. The first difficulty is to determine what we are to regard as rheumatic carditis. I do not at present know of any specific test, and we must rely on the judgment of the practitioners in the area selected, aided by some kind of definition of the cases to be noted, and, if possible, by referees with special knowledge of the disease for doubtful cases.

I think some little time should be spent in explaining the nature of the investigation, so as to enlist the enthusiastic help of the medical men concerned. For the reports which they would be asked to make adequate payment must, of course, be arranged. I do not know of any area more suitable from the economic point of view than that surrounding Bristol, and I hope it may be possible to organise the inquiry in that area. It will take two or three years to get ready for it, but I believe my Bristol colleagues will help, while so far as Gloucestershire is concerned it seems to me that the medical organisation which we all associate with the name of Dr. Middleton Martin will greatly facilitate these preparations. And I must confess that it seems to me peculiarly fitting that we should look for a lead in this matter to the general practitioners of the very county in which that prince of general practitioners and clinical observers, Edward Jenner, read to the Medico-Convivial Society of Gloucestershire in the parlour of the Fleece Inn at Rodborough, "Remarks on a Disease of the Heart following Acute Rheumatism," which entitle him to claim with Pitcairn the honour of initiating the campaign that we are now taking up against this crippling and destructive infection.

References.—1. Quoted in Brit. Med. Jour., 1896, i., 1296. 2. Lumleian Lectures, THE LANCET, 1909, i., 1159, 1227, 1297. 3. Loc. cit. 4. Researches on Rheumatism. 5. Journal of Pathology and Bacteriology, 1911, xv., 489. 6. THE LANCET, 1912, ii., 1209. 7. THE LANCET, 1904, i., 565. 8. Milroy Lectures, Brit. Med. Jour., 1895, i., 527, 581. 9. Loc. cit.

PESTILENCE IN THE NEAR EAST.

UNDER the title of "Health Conditions in Eastern Europe: Typhus a Serious Menace," Major F. Norman White, I.M.S., C.I.E., delivered an important lecture under the auspices of the Chadwick Trust at the Surveyors' Institution, Gt. George-street, Westminster, on July 15th, Sir William J. Collins being in the chair. Major White, who is a medical officer under the Ministry of Health, has just returned from Eastern Europe, where, as Commissioner for the Typhus Commission of the League of Nations, he has been visiting the infected areas. The countries chiefly considered were Latvia, Esthonia, Lithuania, Poland, and the Ukraine, all situated on the border of Soviet Russia.

The Conditions in Russia.

With regard to Russia, said the lecturer, detailed information was lacking, but it was known that health conditions were appalling, and the incidence of typhus and other epidemic diseases had been exceedingly high. The deplorable situation in Russia was one of the chief contributory causes of the unhealthy conditions now prevailing in the countries under consideration. It was, however, difficult to appraise the degree of credence that could be awarded to such vital statistics as emanated from Russia in existing circumstances. He had been informed by Dr. Haden Guest, who had just returned from a mission to Russia, that during 1918–19–20 Russia and Siberia had been swept from end-to-end by typhus fever and that scarcely a town or village escaped. It was stated that some 50 per cent. of the doctors attendant on typhus fever patients had died of the disease. Recent cables stated that cholera is widespread in Southern Russia and is causing there a very high mortality.

Poland's Handicap.

Of the states involved Poland was the largest and the conditions there would apply almost equally to the neighbouring states. Through Poland passed most of the main lines of communication by road and rail connecting Russia with Western Europe, consequently the efficiency of Poland's organisation was a matter of very direct concern to Central and Western Europe. Poland, too, had suffered more from epidemic diseases than had her smaller neighbours and her task was the most difficult, though similar in kind. Poland's strenuous efforts to work out her own sanitary salvation in spite of overwhelmingly important preoccupations entitled her to special consideration. Poland was a densely populated country for its degree of industrial development, with 250 persons to the square mile. Sanitary conditions, even before the war, were in a deplorably backward condition. Only three towns of what was now Poland had anything like an up-to-date water-supply, and in Warsaw alone was there any modern system of sewage disposal. Facilities for cleanliness in the form of public baths and other conveniences were extremely deficient. Scavenging was inefficiently carried out. The standard of personal cleanliness was low, especially in the poor Jewish quarters of the towns. The death-rate was very high, though coincidently a very high birth-rate (40·6 per 1000 in 1910) was probably a marked feature of the vital statistics. Tuberculosis was prevalent in the towns. The infantile mortality-rate was excessive. The deaths of children under one year of age in the Austrian part of Poland during the quinquennium 1906–10 averaged 205 per 1000 births. Epidemics closely followed the outbreak of hostilities. In 1915 in a small part of Galicia that was free from Russian occupation there were 19,000 cases of typhoid fever, 11,000 of dysentery, 8000 of typhus, 21,000 of small-pox, and 29,000 cases of cholera. As the war progressed affairs became progressively worse. In 1917 the deaths outnumbered the births in every town and district of Poland. In that year the tuberculosis death-rate in Warsaw was 7·3 per 1000, and in Lodz 11 per 1000. Infantile mortality rates were higher than ever, and such diseases as rickets were said to be increasingly prevalent.

Typhus, Checked and Unchecked.

A serious epidemic of typhus still raged, more especially in Eastern Galicia, the conditions for its spread being particularly favourable owing to the devastation caused by war and consequent overcrowding. In Congress Poland 325,000 houses had been destroyed, and in Galicia 438,000. Soap, fuel, and other essentials to cleanliness were unprocurable in most parts, and elsewhere difficult and costly to obtain; changes of clothing were difficult to get; lousiness among the poor population was almost universal; dirt and

squalor characterised the poor quarters of the towns; privation, want, and disease had diminished the vitality and lowered the resistance to infection of large masses of the population and produced a condition of apathy that would be difficult to overcome. Over and above all this there had been a constant and continuous stream of civil and military refugees crossing the Polish borders, many of them infected with typhus contracted in Russia; the vast majority of them were infested with lice and other vermin. Between November, 1918, and January, 1920, 653,000 prisoners of war of all nationalities passed westwards over the Polish frontier, as well as 627,000 emigrants returning to Poland. These were all registered in the various posts through which they passed. In addition, some large numbers of refugees from the neighbouring war zone crossed the border. This primary source of infection of many diseases continued to operate. It was estimated that there were still a million persons in Russia waiting to be repatriated, and refugees and prisoners of war continued to increase the dangers of infection. All these unfortunate people came from areas where disease was already out of hand. The cessation of hostilities between Poland and Russia would not mean an immediate amelioration of these conditions and resumption of cross-frontier traffic, and trade would have its attendant public health dangers. In 1919 there were no less than 231,000 cases of typhus notified in Congress Poland and Galicia, and probably at least half the total number of actual cases were unnotified. During a short tour which he (the lecturer) made last month in Eastern Galicia scarcely a town or village was free from typhus, and this at a time of year when conditions should have begun to improve. There were good grounds for regarding the outlook for Galicia next winter as serious in the extreme.

The persistence of typhus was, perhaps, a better index of insanitary conditions than is furnished by any disease. Where typhus abounded there most other epidemic diseases could flourish. In temperate climates, if conditions were such that typhus could not flourish, the incidence of most other communicable diseases was likely to be low. Dangerous foci of epidemic disease were of more than local importance; mankind could not with impunity suffer plague spots to persist, especially when situated in the midst of civilised Europe. Persistence of present conditions would entail a never-ceasing vigilance on the part of the health authorities of more happily placed countries such as our own, and even then the disease might break through our barriers. This was well illustrated by the serious epidemic in Holland, a peaceful, well-fed, and prosperous country, in 1918. The menace of typhus was a very real one.

Interaction of Disease and Social Unrest.

The persistence of typhus and other epidemic diseases in Poland and adjacent countries was in part an economic question. High prices, scarcity of food, underfeeding, overcrowding, were all factors that no epidemiologist could overlook. Undue prevalence of disease might in its turn be directly responsible for such economic conditions as prevailed in Eastern Europe, and was a factor of great moment in keeping the populations in a state of constant ferment. Improved economic conditions were almost impossible in existing health conditions. At the root of inefficient labour, deficient output, and industrial unrest there often lay a removable pathological cause whose consideration would lie within the legitimate scope of the public health of to-day. Prevalence of disease might likewise play no insignificant part in the production of such social unrest as at present characterised Russia. A return to more normal conditions—political, social, and economic—on the continent of Europe had little likelihood of being attained unless and until the health conditions underwent substantial ameliorations. Excessive prevalence of disease, too, had a markedly deleterious effect on the physique and development, both physical and mental, of the rising generation, while education was retarded. All these things were factors in unrest.

Present and Future Needs.

The League of Nations had recently created a Typhus Commission, whose function it would be to aid the Eastern countries in their great health task. It was hoped that two million sterling would be raised, the minimum amount necessary to render adequate help. In addition the League of Red Cross Societies was issuing an urgent appeal to supplement the work that was already being done by voluntary societies. It was very desirable that adequate funds should be forthcoming sufficiently soon to enable next winter's epidemic of typhus to be forestalled. In the Baltic States conditions in regard to typhus fever had somewhat improved; Finland appeared to be practically free from the disease. In Esthonia there were less than 200 cases, in Latvia 879, and in Lithuania 590. In these countries American Red Cross doctors were rendering valuable aid in controlling the disease. There was very little typhus at present in Roumania, and it was chiefly confined to the Northern districts bordering on Galicia, the Ukraine, Bessarabia, and Maramures. In the Ukraine conditions had been very bad, and from 10 to 15 per cent. of the population had succumbed to typhus or relapsing fever. But generally the outlook was grave enough to call for immediate palliative measures. The lecturer's recent visit to Poland on behalf of the League of Nations had been made with the primary object of ascertaining how foreign countries could best supplement Poland's efforts in the anti-typhus campaign. The best possible use was already being made of the very inadequate resources, and the energy displayed by the Chief Epidemic Commissary in Galicia was worthy of admiration. The plan adopted by the Polish Ministry of Health included arrangements for the establishment of a series of quarantine and observation stations along the Eastern border of all the main roads and railways, where refugees and emigrants could be cleansed, fed, and clothed, each station having a hospital attached to it; the establishment of hospitals in each district for the reception of cases of infectious diseases, also the establishment of corps to clean up infected houses and villages; and the installation in towns and villages of bathing, cleansing, and disinfecting plants. Essential, however, as this scheme was in all its details, it was quite beyond the resources of the Polish Government at the present time. Additional hospital material for at least 20,000 beds with full equipment was needed at once, disinfecting apparatus in large amount was required, clothing for refugees was an indispensable necessity, and would entail a very large expense. The rags of the refugees fell to pieces if attempts were made to rid them of vermin, and during the next twelve months something like two million shirts and a proportionate amount of other clothing would be called for. Soap in almost unlimited amounts was required, and certain foodstuffs for the quarantine stations and hospitals were needed, together with transport vehicles. Doctors and nurses were required to supplement the work of the insufficient and overworked Polish medical personnel. Only adequate help from more fortunately placed countries would rid Europe from what was a very real peril.

In concluding, the lecturer paid a warm tribute to the work of the American Red Cross, the "Hoover" Organisation, the European Children's Relief Fund, which during the past few months had provided 1,300,000 persons with one meal a day, the Jewish American Joint Distribution Committee, the National Alliance of American Poles, the Society of Friends, the American Typhus Relief Expedition, the Polish Red Cross, the British Red Cross, and the League of Red Cross Societies.

PUBLIC HEALTH IN TASMANIA, 1918-19.

SOME important advances in public health legislation in Tasmania were made by the passing of the Hospitals Act (1918), the Midwives Act (1918), and an Amendment to the Public Health (Venereal Diseases) Act of 1917. By this last measure a medical practitioner who has reason to believe that a patient suffering from venereal disease intends to contract marriage is directed to notify his belief to the chief health officer, who shall thereupon inform the other party to the proposed marriage or the parent or guardian of such party. No liability for defamation shall be incurred by a practitioner making such notification in good faith. Dr. A. H. Clarke, the acting chief health officer, considers that the same privilege should be extended to practitioners making similar communications in good faith in the case, e.g., of men with syphilitic sores on their hands who have the handling of food for human consumption. It is satisfactory to learn that the venereal disease notifications, numbering 366, during the 12 months from July, 1918, to June, 1919 (of which 307 were for gonorrhœa), were 77 less than in the 12 months preceding. Dr. Clarke points out, however, that "until facilities are provided in every important centre of the State for the treatment of persons suffering from venereal disease it will not be possible to grapple with this important health problem." Diphtheria was prevalent (737 cases and 17 deaths), but evidently in a very mild form; about a quarter of the cases occurred in Launceston. There were 189 cases of phthisis and 144 of typhoid fever throughout the State and no other disease prevalence of any importance. Dr. Clarke describes the scheme of operations that was decided on in the event of influenza appearing in epidemic form in Tasmania, but happily no cases had occurred up to the date of this report (August, 1919).

THE GOLDEN RULE AS APPLIED TO TUBERCLE.

GIVING evidence on Feb. 3rd, 4th, and 5th, at Washington, before the Committee on Public Buildings and Grounds of the House of Representatives, Dr. E. R. Baldwin emphasised the need for providing attractive, as well as hygienic, accommodation for consumptives. "..... Whatever buildings the United States Government constructs, my advice would be, as a tuberculosis specialist, and as a patient myself, not to put the tuberculosis soldier in a place you would not be willing to go to yourself. That is the crux of the thing."

An Address

ON

TOXIC IDIOPATHIES:

THE RELATIONSHIP BETWEEN HAY AND OTHER POLLEN FEVERS, ANIMAL ASTHMAS, FOOD IDIOSYNCRASIES, BRONCHIAL AND SPASMODIC ASTHMAS, ETC.

Delivered at the Royal Society of Medicine

BY J. FREEMAN, M.D., B.CH. OXON.,
DIRECTOR OF THE DEPARTMENT OF CLINICAL BACTERIOLOGY OF ST. MARY'S HOSPITAL.

MR. PRESIDENT AND GENTLEMEN,—There are a number of affections, apparently dissimilar, which for their study and treatment should be classed together; I have done so by calling them by the group name "toxic idiopathies." I hope to justify this name to you to-day; and I shall be able to make myself clearer if I work through my subject in the order in which the various problems actually occurred to me. This arrangement will give the advantage of proceeding from the better to the less understood parts of the subject.

HAY FEVER.

Hay fever is one of these toxic idiopathies. Leonard Noon started work on this ten years ago; after only a few months he fell ill, and I have been working at the subject since then. It will be convenient to take hay fever as our type, but it will not be necessary, and we should not have time enough, to discuss hay fever exhaustively. All we need do is to tabulate the facts which serve to link it up with the other toxic idiopathies to be discussed later.

I. *Causal agent.*—Grass pollen stands in much the same causal relationship to hay fever that the tubercle bacillus holds in tuberculosis. In this sense pollen—and only grass pollen—causes hay fever; it does so whenever it comes into contact with the tissues of the susceptible person. It can do this at any time of the year, but only does so in nature when the grasses are producing pollen. The incidence of the disease shown in Diagram 1 exactly corresponds to the period of grass pollen production. Experimentally, however, the disease may be produced at any time of year by pollen which has been kept in a dry state.

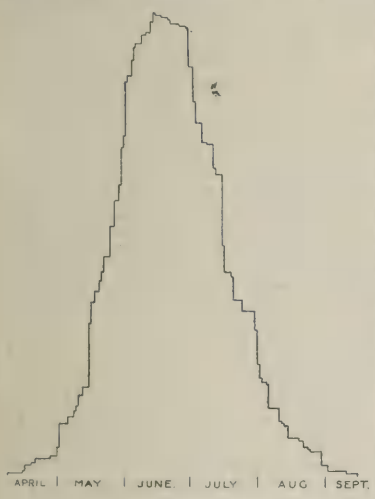


DIAGRAM 1.—Curve showing case incidence of hay fever, compiled from some 300–400 cases studied in the last 10 years.

II. *Spontaneous local symptoms.*—Symptoms are experienced at every point where this pollen can get to work on the tissues of hay fever sufferers. As grass pollen is adapted for its purpose of cross-fertilisation by being extremely easily air-borne (it will even float in air from Norway to Yorkshire, as Blackley showed by his ingenious kite experiments), it is always present in the atmosphere during the grass flowering season, except when it has recently been precipitated by rain. It will, therefore, come in contact with the external surface of the body; but the skin of most pollen-sensitive persons is too thick, too much covered by the dead horny layer of the epithelium, to permit any biological reaction except at the conjunctiva or the mucous membrane of the air-passages. Here, therefore, the local symptoms of hay fever are produced in greatest intensity: inflammation, irritation, œdema, coryza, lacrimation, and sneezing; but thin-skinned persons (chiefly women and children) may suffer itching, erythema, and even urticarial weals over the skin of the face and neck, and some very thin-skinned persons experience this over the entire body.

III. *Artificial local symptoms.*—The natural symptoms can be reproduced at any time of the year, either with dry pollen, or more mercifully with a carefully diluted watery extract of the pollen. Diagram 2 shows the effect on the eye of a hay fever patient, and this ophthalmo-reaction will either: (1) serve as a diagnostic test at any time of the year of the pollen susceptibility which characterises hay fever; or (2) if the reaction is conducted with known dilutions of the pollen extract an estimate can be made of the degree of the susceptibility of that patient.

That the whole body is sensitive, and not merely the eyes, nose, and throat, is shown conclusively by producing reactions in abnormal sites. Dunbar placed pollen in the rectum and got the symptoms. More conveniently, one or two scratches through the horny layer of the epidermis will permit the pollen to act on the living tissues at any point of the body surface. Diagram 3 shows the effect produced by pollen or by a watery extract of pollen on the scratched skin; and such a cutaneo-reaction can, like the ophthalmo-reaction, be used either for diagnosis or quantitatively for measuring the degree of sensitiveness.

Pollen experimentally swallowed with the food gives rise to nausea, vomiting, a feeling of indigestion, and diarrhœa. As this will be of special interest when we consider the toxic idiopathies connected with food sensitiveness, I may, perhaps, here give a sample experiment.

A young man in my hay fever clinic at St. Mary's Hospital recognised in someone who came to see me a brother-in-arms from the same battalion in the war. They readily agreed to split a bottle of beer surreptitiously doctored with pollen. The normal man drank fair but experienced no sensations, but the hay fever patient had marked nausea for four hours, especially on exercise, and, what was most unusual for him, distinct looseness of the bowels for a day or two.

IV. *Constitutional* or distant effects are also produced by the irritant: lassitude, depression, irritability, headaches, general urticaria or œdema, and asthma. Such general symptoms are produced by the natural disease and also by the experimental administrations of pollen at abnormal sites—e.g., by large hypodermic doses (large, that is, from the point of view of therapeusis or prophylaxis), or by incautiously severe skin reactions, or by the experimental ingestion of pollen in the food.[1]

V. The *specificity* is very marked. None but hay fever sufferers will ever react to grass pollen, and grass pollen produces no effect on normal persons.

VI. The *commencement of attacks* may seem to the patient to be due to many things. When, but only when, grass pollen is in contact with the tissues (normally, i.e., when it is in the air during the times of incidence shown in Diagram 1) the hay fever symptoms may be precipitated by a number of diverse stimuli—e.g., by any mechanical irritant, by any strong smell, "even the smell of my dinner," any strong light, a change from cold to hot surroundings (and vice versa), by any strong emotion, like the shock of bad news, or by suggestion. These statements are admittedly given without proof or explanation; perhaps the last of this somewhat indigestible list may be illustrated by comparison with sea-sickness. Vomiting may often be promptly induced, but only on board ship, by people speaking of sea-sickness or by someone imitating a rolling motion; in the same way sniffing at an artificial rose or merely listening to a vivid

[1] Such experimental contact with pollen in abnormal situations may also produce the eye, nose, and throat symptoms of the natural disease. This would certainly seem to denote local sensitisation, but this does not concern our argument here.

description of a sunny field on a hot still day may produce, but only in the hay fever season, fits of sneezing or the ophthalmo-reaction shown in Diagram 2.

All these, as it were, "detonations" of hay fever symptoms may profitably be borne in mind when considering some immediate "causes" of symptoms (e.g., of asthma) in the other toxic idiopathies.

VII. *Passive immunisation* may be produced against hay fever—that is to say, one may immunise a horse or other animal with grass pollen, and the serum of such an animal will give some degree of alleviation from the symptoms. This work was carried out by Dunbar, of Hamburg, the serum being known as pollantin; and it is important to note that pollantin will give definite relief, though this is so slight and transient that the effect is negligible if the case is at all severe.

VIII. *Active immunisation* with a vaccine made from the grass pollen works well, both for prophylaxis and for therapeusis. Noon selected his doses by tracing with the ophthalmo-reaction their effect on his patients; one can also use the cutaneo-reaction. The two curves in Diagram 4 show the changes in sensitiveness which follow the administration of a pollen vaccine. One is measured by the ophthalmo- and the other by the cutaneo-reaction method.

Though there are, of course, failures to deplore, yet from 80 to 90 per cent. of hay fever cases inoculated during the last ten years have been well pleased to have been so treated, and with many of these the results are really striking.

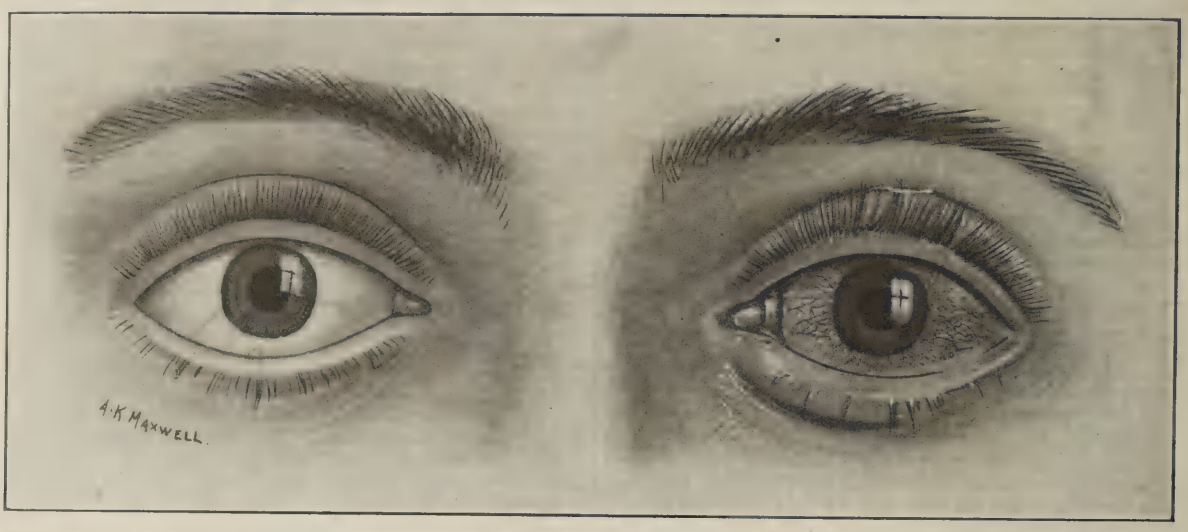


DIAGRAM 2.—Ophthalmo-reaction for diagnosing hay fever. First very dilute extracts of grass pollen, then progressively stronger extracts, are dropped on the eyeball of the patient till a slight itching and a faint redness develops at the inner canthus of the eye. The eye to the left in this diagram shows the normal condition; the other eye shows a definite hay fever reaction. The reaction should take about three minutes to develop.

For three months in every year a man had to go to sea because of hay fever, and ruined his business in consequence. One year, through pressure of work, he risked staying in London, and, as a result, spent two months in a dark room with his body packed round with hot-water bottles to stop the shivering fits and his head packed with ice-bags, the conjunctiva skinning off his eyeballs and his lungs gasping for breath. Since his inoculation treatment began nine years ago that man has been at work through each summer, and last year told me that for half an hour one afternoon he "felt a slight annoyance from the old enemy."

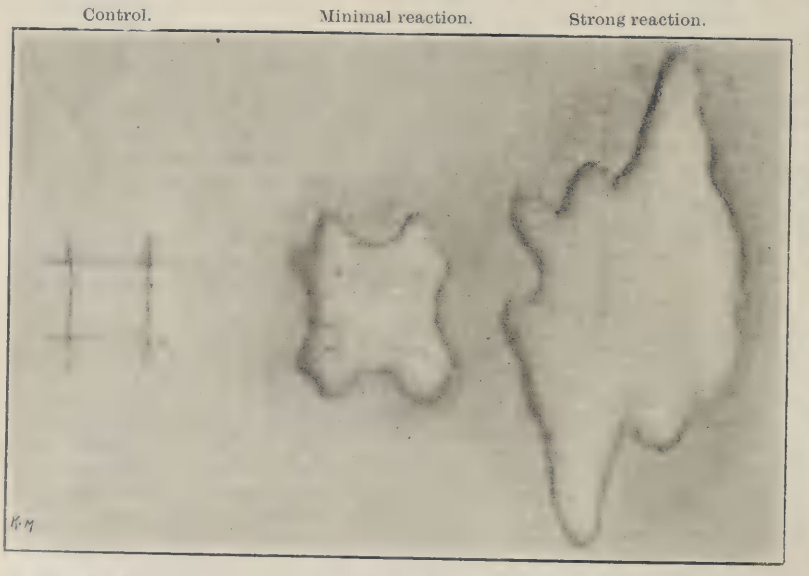
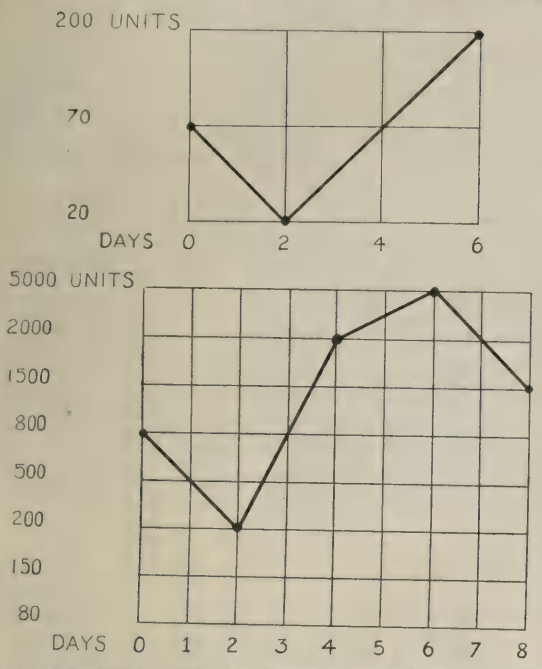


DIAGRAM 3.—Cutaneo-reaction for diagnosing hay fever. Some convenient portion of the skin is scratched to remove the dead, horny layers and then a watery extract of grass pollen is placed thereon. The diagram shows to the left no reaction; in the centre a minimal but definite reaction; to the right a severer reaction produced by a stronger extract. This reaction takes from 10 to 15 minutes to develop.

IX. *Heredity* is strongly marked in hay fever, as Diagrams 5 and 6 show clearly enough; the monogram made by compounding the letters H and F indicates in this and the succeeding genealogical tables the incidence of hay fever. (In Diagram 6, where H is added, the individual had horse asthma as well as hay fever; the significance of this is mentioned later.) In going over my records of cases last summer I was able to pick out some 200 well-marked examples of heredity, any one of which could have served for my argument. Heredity, we shall find subsequently, is a link which closely binds together the different toxic idiopathies.

For portability we may summarise the foregoing characteristics of our typical toxic idiopathy as: (*a*) the *symptom-complex* both of the natural and also of the artificial disease; (*b*) the *specificity* both of the irritant for that particular patient and of the patient for that particular irritant; and (*c*) *heredity*.

Other pollens than grass pollen produce reactions, each acting on the eye or on the skin of those sensitive to that particular pollen, causing reactions precisely like those shown in Diagrams 2 and 3. Also these pollen sensitivenesses tend to run in hay-fever tainted families—that is to say, they will either affect sufferers from hay fever or their close relatives. Diagram 7 shows in tabular form the response which a number of hay



DIAGRAMS 4A and 4B.—The two curves show the effects on the sensitiveness of a hay fever patient to grass pollen after hypodermic inoculation of a grass pollen vaccine. The upper curve is measured by the ophthalmo-reaction, the lower curve by the cutaneo-reaction. The vertical lines show days after the dose.

fever patients and two relatives show when tested with grass pollen and a random collection of 25 other pollens. From this we may judge that practically every pollen one cares to test will react on some person or another with the hay fever taint; but note how capricious is the selectiveness of the different pollens, reacting with some hay-fever tainted persons strongly, with other persons reacting only weakly, and with others again not at all. One must regard each as being the irritant of a separate toxic idiopathy; each is a potential cause of a fever parallel to hay fever.

How, then, can one say that, in England at any rate, grass pollen causes the only pollen fever which counts? Because in this country grass pollen alone fulfils all the three essentials for a considerable disease. These are: (1) production in sufficient amount; (2) capacity for producing a strong reaction; and (3) dissemination by light wind. For example, many varieties of daisy pollen are frequently strongly toxic and produced in considerable quantities, but this pollen only flies yards where the grass pollen flies miles. Again, the pollen of the firs and pines is produced in large quantities, and is fairly easily borne on light airs, but proves to be only slightly toxic for most persons with the pollen-sensitive taint (Diagram 5 chances to over-represent the toxicity of the coniferæ). In America, however, there is an indigenous race of composites which provoke an intense reaction in those who happen to be susceptible, and, in addition, the pollen is produced in large quantities and is very easily wind-borne. As a result, in America there are two pollen fevers, one occurring at the time of the flowering of these composites—viz., in August, September, and October—which is known as the American autumn fever, and another at the time of the flowering of the grass, which happens about the same time as in Europe, and is, therefore, known as the June fever. It is this latter alone which is rightly called hay fever.

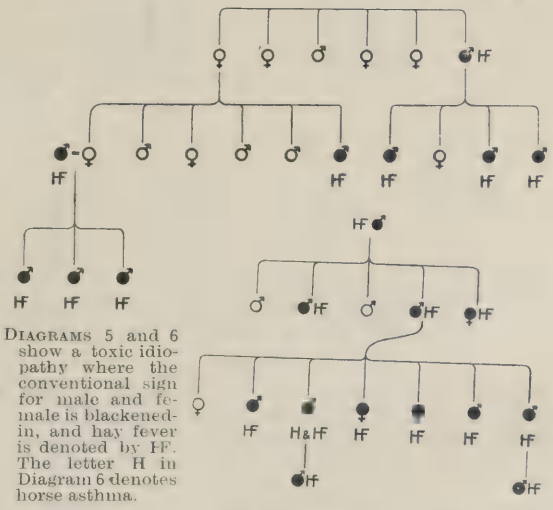
There is much talk in America and elsewhere of pollen fevers caused by other trees and plants, but time will show if they are any of them of much importance. As we have seen, every one of the pollens produces toxic effects upon susceptible people, and it is merely a botanical accident as to whether the particular toxic idiopathy in question makes serious trouble for humanity or not.

ANIMAL ASTHMAS.

Eight or nine years ago hay fever seemed to stand alone, but Dunbar told me that the horse sensitiveness known as "horse asthma" was an occasional symptom, or at least was never found, except associated with hay fever; this, it now appears, is not always true, but why it should frequently be so will be shown when discussing heredity presently. The irritant is usually airborne, and so the local symptoms are similar to those of hay fever; the victims get red eyes, a running nose, much sneezing, and a tickling throat when near horses, and constitutional symptoms such as are found in hay fever. All these symptoms are produced, especially if the animals are lathering freely or in an ill-ventilated stable. With "horse substance" in place of grass pollen one can carry out parallel reactions to those used for diagnosing or estimating the sensitiveness to hay fever, and Diagrams 2 and 3 would serve equally well for a horse-asthma reaction. Normally it is the horse dandruff (i.e., the débris which comes off on a curry-comb) which picks out for us the horse asthmatic, but almost any part of the horse will provoke the reaction—the flesh, the serum, the urine, the fæces, or the mucous discharge from the nose. Furthermore, other members of the horse tribe share with horses this power to react with a horse-sensitive person, as Diagram 8 shows.

A couple of examples of horse asthma will bring out most of the characteristics and make it a definite disease-entity for us.

An officer in the Horse Guards developed horse asthma and so had to resign his commission; also he had to give up hunting and avoid hunting men until they had changed their clothes and washed after riding. He quickly learned to avoid the trouble, but once, when shooting in Scotland, put on his mackintosh because it was raining. Almost immediately he began to have bad asthma, could not put a gun to his shoulder all day and, on returning to the house, found he had put on the mackintosh belonging to a horsey man, who always wore it when on horseback or kept it rolled up on the horse's withers. The same patient when stopping in a house where a case of diphtheria had occurred received from the local practitioner a dose of antidiphtheritic



DIAGRAMS 5 and 6 show a toxic idiopathy where the conventional sign for male and female is blackened-in, and hay fever is denoted by HF. The letter H in Diagram 6 denotes horse asthma.

serum which, of course, is obtained from horses. As a consequence they sat up with him all night, and were very relieved that he survived. He finds London nowadays very much more comfortable because of the motors, but if there is any wind on a dry day he has to bolt for home because his eyes get affected by the horse-dung, which constitutes the bulk of London street dust.

A lady had for years been noted as a horse asthma patient. Anybody who touched a horse's skin and then rubbed it on the skin of this patient would produce a great urticarial wheal, or if on the face would probably make the eyes bloodshot. Her serum given to a guinea-pig would passively sensitise it to horse serum 48 hours after; human serum and horse serum being, of course, in themselves quite innocuous to guinea-pigs. This same lady was out at a luncheon party one day and developed terrible asthma in the middle of the meal. Suspicion fell on some sausages, which by serological tests were proved to contain horse meat. An injection of horse serum given thoughtlessly on another occasion made her very ill, but relieved her horse asthma for four months.[2]

The ramifications of this strange illness are many. The danger of employing curative sera in such cases is obvious; not so obvious is the necessity for avoiding horsehair mattresses or horsehair upholstery.

occasion a cat strolled into the room where the King and this patient were talking. The latter clenched his hand and tried "to stick it out," but almost immediately incontinently bolted, and had to make his explanations later.

Similarly we have a sensitiveness to sheep, cows, pigs, rabbits, goats, and all the rest of them.

A man who has always hated the presence of rabbits or rabbit meat or rabbit skin. He is devoted to shooting, but always has to get the keepers to put him where there have not been rabbits about; otherwise he knows that he will not hit a bird.

Among these animal asthmas should be included a sensitiveness to the emanations from feathers of birds. This would seem at first sight more trivial than, say, a cat asthma, but is really much more important when it exists; a little tumbling about of pillows, bolsters, quilts, sofa cushions, and soft upholstery in general, will

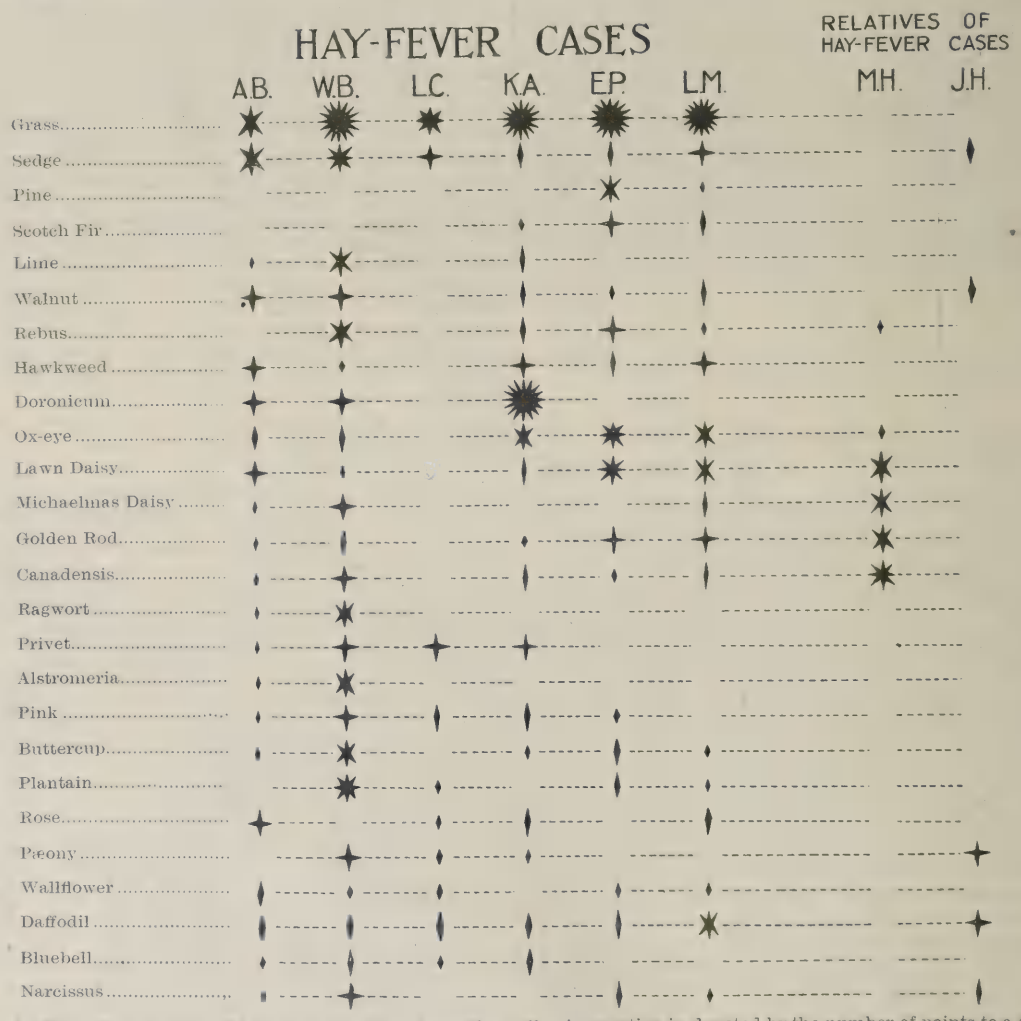


DIAGRAM 7.—Here the extent to which the patient reacts to the pollen in question is denoted by the number of points to a star. The names of plants to the left of the diagram give the type of pollen employed for the particular reaction, and the initials along the top indicate the individuals upon whom these tests were carried out. The first six are hay fever sufferers, the two individuals to the right are relatives of hay fever sufferers and appear in Diagram 13, marked with an asterisk.

Cat and Other Animal Asthmas.

Parallel with horse asthma you have cat asthma, in which various substances from the cat (particles from the fur, the serum, the urine, &c.) provoke skin or eye reactions, like those shown for hay fever in Diagrams 2 and 3.

A patient who had some post at Court told me that he could not bear the presence of cats. They made him gasp for breath, so that he could not stay in the room with them, and would subsequently give him asthma. When you are in the presence of royalty, I understand, you are, so to speak, on parade: you must not go until dismissed. But on one

send the feather particles into the air. In the words of a patient, "You must put your head on the pillow as if on a wasps' nest." Even the swan's down powder puff may cause trouble.

We summed up hay fever, our type of a toxic idiopathy, under the three headings of Symptom-Complex, Specificity, and Heredity; now let us see how the animal asthmas correspond under these headings.

Symptoms.—As far as circumstances permit, these are identical both in local and constitutional effects. The experimental symptoms also correspond. The respective ophthalmo-and cutaneo-reactions are indistinguishable; an injection of an extract of curry-combings (or,

[2] Besche, of Christiania, in Berlin Klin. Woch., 1918.

as we have seen, of antidiphtheritic serum) causes the same symptoms as those which follow an over-bold dose of grass-pollen extract in the hay fever subject. Similarly, eating horse or rabbit produces much the same effect on those sensitive to that particular animal as the experimental ingestion of grass pollen by a hay fever subject.

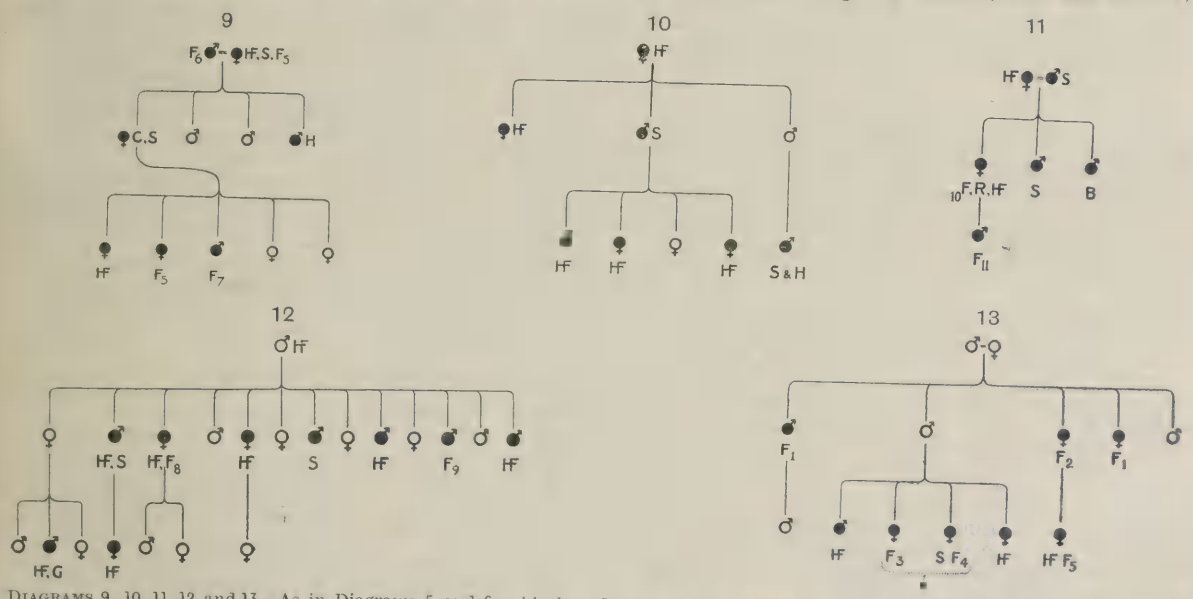
Specificity.—Here, again, they correspond. The horse asthmatic is sensitive to horse substance and not necessarily to anything else. Each animal substance is sharply specific for its own type of asthmatic, but a patient may suffer from two or more animal asthmas at a time, just as the hay-fever patient may be sensitive to other pollens—e.g., from ox-eye daisies or pæonies. Again, let us say the horse asthmatic may also have hay fever (this occurs in perhaps 40 per cent. of my cases), or he may be quite non-sensitive to pollen; or he may have hay fever early in life, grow out of it, and then develop some animal asthma later in life.

The different animal asthmas are separate or, at any rate, separable toxic idiopathies.

Heredity.—In the hereditary nature of the diseases the animal asthmas correspond to our type, but as they are each of them much rarer than hay fever it is difficult to demonstrate many, say, of horse asthmatics in one family. On reviewing many family histories we find good evidence of heredity, and also that different animal sensitivenesses tend to run in the same family (suggested here by Diagram 9, where a sister is sensitive to cat and a brother to horse).

It is quite clear, even from the few diagrams of heredity here published, that the animal asthmas tend to run in the same families as the hay fever cases; we have horse here in Diagrams 6 and 10, horse and cat in 9, rabbit in 11, and goat in 12, all relating to, and half of them coinciding with, hay fever cases (besides coincidence with, and relation to, the toxic idiopathies to be mentioned next). We have seen that sensitiveness to any particular pollen other than grass tends to run in hay-fever tainted families; so that all our toxic idiopathies tend to be inherited together—there is a common taint.

DIAGRAM 8.—Shows the typical response of a horse asthma patient to various members of the Equidæ.



DIAGRAMS 9, 10, 11, 12, and 13.—As in Diagrams 5 and 6, a blackened male or female sign denotes a toxic idiopathy, while the nature of that idiopathy is denoted by the letters attached:—HF, Hay fever; H, Horse asthma; C, Cat asthma; G, Goat asthma; R, Rabbit asthma; B, Bacterial asthma; S, "Spasmodic" asthma; F, Food idiosyncrasy, and the number attached denotes the particular food which reacts: 1, Lobster; 2, Lobster, anchovy and duck egg; 3, Oysters; 4, Mackerel; 5, Honey; 6, Apples; 7, Chicken; 8, Oysters and lobsters; 9, Milk; 10, Onion; 11, Fish.

BACTERIAL AND SPASMODIC ASTHMA.

From my first experience hay fever patients insisted on the occurrence of bronchial and spasmodic asthma in their families; but, to begin with, these complaints were discarded as having no possible connexion with a sensitiveness to pollen. After some time, however, I had to acknowledge that these diseases occurred with significant frequency. It is, again, necessary to work through very many family histories to reach full conviction, but Diagrams 9 to 13 show 11 cases of spasmodic asthma between them and 1 of bronchial asthma. Of these, the bronchial asthma and 4 cases of spasmodic asthma stand alone, though closely related to hay fever and other toxic idiopathies; 2 cases of spasmodic asthma coincide with hay fever, 1 with cat asthma, 1 with horse, and 2 with toxic idiopathies, to be described later.

For many years before the war we of the Inoculation Department of St. Mary's Hospital (and doubtless many others elsewhere) had been inoculating against bronchial asthma by immunising against the bacterial cause of the bronchitis, and frequently with strikingly successful results, and we were driven to the conclusion that the asthma was the remote effect of the bacterial infection. I believe now this asthma is a toxic idiopathy to the endotoxins of that particular microbe.

The specific ophthalmo- and cutaneo-reactions of the pollen-sensitive or animal-sensitive persons (Diagrams 2 and 3) are exactly paralleled by the ophthalmo- and cutaneo-reactions produced by the extracted endotoxins on the bronchial asthmatic,[3] and such reactions are bacterially specific—e.g., a man infected with Pfeiffer's *B. influenzæ* will react to that particular microbe on the scratched skin.

Again, just as violent asthma, œdema, and urticaria can be produced by injudicious injections of the specific irritants in hay fever and animal asthma subjects, so will the same symptoms be produced by too large an injection of the appropriate bacterial vaccine in a case of bronchial asthma, especially by the first dose or two of any series of inoculations.

It is important to note that for bacteria to produce asthma they need not be infecting the bronchi; they may, for instance, be infecting the gut wall—thus, perhaps, paralleling the effect of pollen in the food of a hay fever subject or the specific meat in the food of an animal asthmatic.

A bad case of asthma of several years' standing came to be treated by vaccines, but was refused because no infection of the bronchi could be found, and the case was apparently one of spasmodic asthma. At a second visit a history was obtained of chronic bowel infection, slight pain, and recurrent diarrhœa. A bacteriological examination showed an infection of pyocyaneus.[4] A vaccine was used; the bowel disurtbances stopped and the asthma symptoms promptly stopped also. (Personally communicated: Dr. John Matthews.)

This case suggests that bronchial asthma is a regional subdivision of bacterial asthma, and that spasmodic asthma had better be classed as asthma of unknown origin. It may be an undetected case of any one or more of the toxic idiopathies described or to be described here, but it may, no doubt, be due to some unsuspected air-borne irritant, such as the emanations or the spores from moulds—an idea which some cases suggest.

With an unknown irritant one cannot make experiments to prove specificity, but from the symptoms and, above all, from the heredity we must class spasmodic asthma as one of the toxic idiopathies; it remains to make it an asthma of *known* origin.

This was very much the stage the subject had reached before the war when the work had to be dropped. But in the United States of America much valuable work continued on bronchitis, hay fever, and, in particular, on food idiosyncrasies; these are frequently grouped together under the name anaphylaxies.[5] After the war I was anxious to see if my collections of hay fever and other toxic idiopathy cases suffered from any particular food idiosyncrasies. They did, giving quite surprising tales, of which a few examples will suffice to give the clinical picture and show that these disabilities are by no means trivial or "just fads and imagination."

"F_6."—The male ancestor in Diagram 9 was a remarkably healthy man, but apples always upset him. On his honeymoon his wife, after the manner of Eve, persuaded him to eat one; he spent the next 12 hours with violent vomiting and diarrhœa.

"HF F_5."—One of the grand-daughters in Diagram 13 could never since childhood tolerate a trace of honey. After many years' abstinence she took half a teaspoonful as an experiment. Within seven minutes she "came over all queer," and made her way as best she could to her bedroom, where she was found unconscious on the floor. She, too, spent the rest of the day with vomiting and diarrhœa. She gives the cutaneo-reaction as in Diagram 3, either with direct honey or with the trace of proteid precipitable from honey solution.

"F_2," the mother of the last example in Diagram 13, used to be sensitive to eggs, coming out in urticarial rashes whenever they were eaten. She has gradually accustomed herself to them, but remains sensitive to the rarer duck's egg. This is corroborated by a strong positive reaction with duck's egg proteid and no reaction with that of hen's egg.

"F_9," in Diagram 12, vomited so uncontrollably when put on cow's milk that, to save his life, he had to be given ass's milk. If he had chanced to be horse sensitive, Diagram 8 suggests that the change of dietary would have been jumping out of the frying pan into the fire.

A girl of 9 has all her life suffered from very bad "spasmodic asthma" accompanying the slight bronchitis which she occasionally had. A streptococcus vaccine was made, but gave little or no relief. A somewhat confused story of delicacy of digestion and tendency to dysentery (when one has had it all one's life one cannot describe nausea) led to skin reaction tests which disclosed a large number of sensitivenesses, amongst them to horse and to hen feather, but most pronounced of all were the reactions to the various flours; strongly to wheat and barley, and very strong to pea, bean, and lentil flour.

The *symptoms* fall into line with those of toxic idiopathies in general, closely resembling what we have seen to follow from pollen, horse meat, or a bacterial infection in the intestines of persons with those particular sensitivenesses. The constitutional troubles—depression, asthma, urticaria, &c.—follow along the same lines too, and one gets ophthalmo- and cutaneo-reactions precisely like those shown in Diagrams 2 and 3.

The *specificity* of the particular irritant for the patient and the patient for that particular irritant is as exact as with, say, hay fever or cat asthma.

Heredity is frequently found to the same food sensitiveness, but more often the food sensitivenesses vary in a family. Common inheritance, together with all the other toxic idiopathies, is seen from the diagrams where "F" denotes some food idiosyncrasy and the number following it denotes the particular food.

Before leaving these food idiosyncrasies some general considerations are worth while. They vary in intensity from a shock producing coma down to a hardly noticeable malaise, and when slight they are usually not detected. Frequently one gets without leading questions the history of "delicate digestion" or of being "faddy about food" from hay fever patients, which turn out to be quite well marked but unsuspected food idiosyncrasies. Another difficulty, both in the general diagnosis of a food idiosyncrasy and in specific diagnosis of the particular irritant, is that the reactions are frequently delayed, both in the natural disorder and in the diagnostic cutaneo-reaction; the delay may sometimes extend from, say, 10 minutes up to as long as 14 hours or longer (this delay also sometimes takes place with the bacterial cutaneo-reactions). So food idiosyncrasies often are unsuscepted. Therefore in an anomalous case of dyspepsia it would be well to look for a family history of toxic idiopathies of any type. If the patient comes of a family so tainted, then the so-called dyspepsia may well chance to be a food idiosyncrasy.

[3] One may get this bacterial cutaneo-reaction in cases of bacterial intoxication—e.g., a bad case of pyorrhœa—which do not have symptoms of asthma, urticaria, &c. It is believed that such symptoms would have been produced if the patient had had the toxic idiopathy taint, but may get rheumatism or gout instead if the diatheses happen to be in this direction.

[4] This organism is frequently much more pathogenic than the text-books allow.

[5] The use of this term would seem to be unfortunate, since the phenomena of the toxic idiopathies do not fall into line with those of anaphylaxy as demonstrable on a guinea-pig. "Anaphylaxy" has grown so protean nowadays as to cover almost any untoward biological reaction, and, therefore, when used so loosely, explains nothing.

Another point worth comment is that food idiosyncrasies are most frequent in childhood. From the day the child is weaned he is constantly meeting new proteid substances in the form of food; and, as a rule, children have an instinctive dislike to new foods or foods prepared in unrecognised ways. Possibly any new type of food requires an immunising effort on the part of the recipient to make that food wholesome, and any failure to so immunise would produce a food idiosyncrasy. Under the eye of a stern parent intent on seeing that the "children are not faddy" and that "good food is not wasted," the dislike and difficulty is soon got over with normal children.

One point of special interest is suggested by one of our examples given above; it must be well worth while to test the cutaneo-reactions of persistently vomiting babies for a milk sensitiveness. Some of the patent foods may work well in exceptional cases for this reason (a case of a child who could tolerate egg substitutes but not egg itself is instructive). In a thesis by L. De May for the University of Lyons 32 cases of uncontrollable vomiting and diarrhœa of infants were successfully treated by subcutaneous injections of cow's milk to produce "anti-anaphylaxis after the method of Besredka."

Worms.

Many other curious sensitivenesses to foreign proteids must apparently be included amongst the toxic idiopathies, but I must be brief. There is, for example, the fact that worms when handled or dissected for some time give all the nasal and eye symptoms of an air-borne toxic idiopathy; and occasionally one finds that children with intestinal worms, who happen also to be of the toxic idiopathy taint, apparently have asthma as a consequence and lose the asthma after the removal of the worms.

Insect Bites.

The bites and stings of animals are another occasion when small quantities of foreign proteid come into intimate contact with our tissues; and it does seem as if people of the toxic idiopathy taint sometimes give much stronger reactions to the bites of fleas or gnats than the normal person does. I am tempted to give a case in point.

Clewes, of Buffalo, U.S.A., who first introduced the use of a pollen vaccine for hay fever into America, told me when recounting his success that the most successful inoculation he had ever given was to a lady who had a house on the borders of Lake Erie. She was being inoculated at the time for hay fever, but was so sensitive to the bites of small gnats from the lake that one single bite, which would hardly have been felt by the normal individual, would cause such great swelling as to send her to bed for days. Clewes got a number of these gnats collected, brayed them in a mortar, and made a vaccine therefrom. After several inoculations the patient could lie out in a hammock at the edge of the lake and be bitten with pleasure.

This sounds a tall story, but she was hay-fever tainted, and if the bites and stings of insects can give rise to toxic idiopathies with people of the correct sensitiveness then it is quite understandable.

CONCLUSION.

I hope I have made it clear that all these apparently diverse affections are linked together in an extraordinary way by (1) their selectiveness; (2) by the symptom complexes; and (3) by heredity. This is worth doing for several reasons. First of all, the very fact of the connexion, and still more so the connecting link if only we could discover it, must have great significance in immunology; secondly, the detection of one definite toxic idiopathy in a patient should put us on the alert to discover others; and, lastly, anything we learn about one will help us in dealing with another toxic idiopathy. This refers chiefly to treatment, for what is sauce for the goose is likely to be sauce for the gander. Excluding all the palliatives, we have choice of two treatments for all of them—(1) avoiding the particular irritant, or (2) immunising against it.

I think it might be exaggeration to say that the study of these toxic idiopathies will open a new field of medicine, but I feel confident that they throw light from a new angle across a very large field of the old medicine.

The Croonian Lectures

ON THE

PSYCHOLOGY OF THE SPECIAL SENSES AND THEIR FUNCTIONAL DISORDERS.

Delivered before the Royal College of Physicians of London, June, 1920,

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LECTURE II.*—PATHOGENESIS OF HYSTERICAL CUTANEOUS ANÆSTHESIA.

MR. PRESIDENT AND GENTLEMEN,—Like all other hysterical symptoms, each of the five classes of hysterical anæsthesia which I have described in my first lecture is the result of suggestion. In the first class, the classical form which has alone been recognised in the past, the idea that a certain area of skin is insensitive to tactile, thermal, and painful stimuli, is in the first instance unconsciously suggested to the patient by the physician who examines him. The second class, the anæsthesia which may follow a condition of stupor, is also due to hetero-suggestion, although it is preceded by anæsthesia which is neither due to organic disease nor to suggestion, but is the result of profound inattention during the stuporose period. In the remaining classes the anæsthesia is primarily organic in origin, being caused by disease or injury of the brain, spinal cord, or peripheral nerves, or by peripheral anæmia. It makes so great an impression on the patient's mind that it is perpetuated as an hysterical symptom after the organic cause has disappeared. This is, no doubt, in part a result of auto-suggestion, but it is clear that such auto-suggestion would very rarely occur if not prompted by a certain amount of unconscious hetero-suggestion on the part of the physician, whose interest in the anæsthesia attracts the patient's attention to what would otherwise be to a great extent ignored owing to the small inconvenience the anæsthesia causes compared with the associated paralysis. So impressed was Babinski [1] with the part taken by the observer in suggesting hysterical anæsthesia that he expressed his belief that the condition never occurred in the absence of such suggestion. Whilst I agree with him so far as the first class of hysterical anæsthesia is concerned, I have certainly seen cases of the third class—that caused by injury to peripheral nerves, and possibly in the fourth and fifth classes, in which any such hetero-suggestion could be excluded with certainty. Although in most of these cases hetero-suggestion undoubtedly plays the predominating part, auto-suggestion generally occurs as well, and in rare cases it is alone responsible for the production of the anæsthesia.

The next question to discuss is by what process anæsthesia develops when it has once been suggested by hetero-suggestion, auto-suggestion, or the two combined. I believe that a consideration of the second class of hysterical anæsthesia, that following stupor, affords the only satisfactory explanation. In order to feel one has to pay attention. If the whole mind is absorbed with one's thoughts, tactile and other cutaneous stimuli will not be felt. Most healthy people are aware of this from their own experience. If one is intensely interested in the occupation in which one is engaged a light touch will not be perceived, or the discomfort caused by external heat or cold or by some form of cutaneous irritation will not be felt until the mind is once more free to attend to such mundane affairs. The importance of this conception can only be fully realised by those who have had the opportunity of examining cases of stupor, such as I have described as occurring in the over-wrought soldier. The patient's mind was obviously absorbed in the contemplation of his own thoughts, which were generally painful in character, and were often so vivid that they could be correctly described as visual or auditory hallucinations.

* Lecture I. was published in THE LANCET, July 24th, 1920 (p. 16

Tickling the face or the soles of the feet, pinching or pricking the most sensitive parts of the skin, or the application of very hot or very cold objects failed to elicit the slightest sign indicating that the individual had felt anything. The conjunctiva, cornea, and nasal mucous membranes were equally insensitive, and all superficial reflexes were abolished. Inattention had resulted in anæsthesia.

When an individual accepts the suggestion that he cannot feel over a certain area of skin he withdraws his attention from this area, and he consequently no longer feels any stimuli applied to it. This conception will be more fully discussed later, when I shall show how hysterical blindness may result from not looking, as without looking it is impossible to see, and how hysterical deafness may result from not listening, as without listening it is impossible to hear. For feeling, seeing, and hearing are active processes, and require an effort of the will just as much as walking. The latter becomes automatic in process of time, but if an individual accepts the suggestion that he cannot walk, he no longer makes the active effort which is required. Without this no walking can occur, however automatic the movement may appear to be in a healthy individual. In the same way, if an individual accepts the suggestion that he cannot feel, see, or hear, he ceases to make the active effort involved in the process of attention to cutaneous, visual, or auditory impulses. To a normal man feeling, seeing, and hearing appear to be the result of cutaneous, visual, and auditory stimuli, respectively acting upon the skin, eyes, and ears; but this is only true if he is actually attending, although this active attention is as little a conscious process as the performance of the individual movements in walking.

A study of the behaviour of the cutaneous reflexes in hysteria will show that an anatomical basis for hysterical anæsthesia must exist, which depends upon the removal of the structural foundation of the psychological process of attention. A reflex is the automatic response to a peripheral stimulus, and is entirely independent of consciousness. It is thus inconceivable that a reflex could be abolished unless some alteration had occurred in the structures which control the reflex arc. The abolition of a cutaneous reflex in organic disease, is, for example, regarded as a proof of the existence of a lesion interfering with these structures. Apart from the abolition of the plantar reflex, when the feet have become cold owing to the feeble circulation caused by disuse in hysterical paraplegia, superficial reflexes are only diminished in activity or entirely abolished in hysteria in the rare cases of hysterical anæsthesia in which sensibility is almost or completely absent. In the exceptional cases of total anæsthesia the corresponding superficial reflexes are lost, just as all superficial reflexes are lost in the total anæsthesia present in severe stupor. Recovery from total hysterical anæsthesia, either spontaneously or as a result of treatment, is accompanied by a return of the superficial reflexes, just as they return when a condition of stupor passes away.

The simplest explanation of the behaviour of the superficial reflexes in hysterical anæsthesia is that the structural basis of the psychological act of attention consists in some change which leads to a diminution in the resistance offered at each synapsis of the sensory tract. Perhaps this is in the nature of a throwing out of dendrites, or it may depend upon some biochemical change in the material which occupies the space between the dendritic terminations of adjacent neurones. Whatever it may be, the increased resistance which is present when attention is very deficient results in anæsthesia, and at the same time a block is produced in the reflex arc which results in diminution or abolition of the reflex.

The usual method of treating hysterical anæsthesia by means of a strong faradic current depends upon the fact that the anæsthesia, however severe, is very rarely absolute. A very powerful stimulus, such as that afforded by a strong faradic current applied with a wire brush, can break through the increased resistance at the synapses in the sensory tract in spite of the almost complete inattention which is present; it is consequently felt. Directly this occurs the patient's dormant attention is awakened; with a little persuasion and perhaps some explanatory conversation, which may be looked upon as acting, at any rate in part, as a counter-suggestion to the original suggestion of anæsthesia, the patient is quickly brought to attend to the stimuli affecting the previously anæsthetic areas of his skin, and normal sensibility returns.

If the anæsthesia is absolute this method cannot be used, as, however strong the painful stimulus may be, it will not be felt. In such a case it may be suggested to the patient that the faradisation of the skin at the boundary of the anæsthetic area will lead to the progressive retraction of this area. The most satisfactory method, however, is to use no suggestion at all, but to explain to the patient why he cannot feel—that he has become accustomed to pay no attention to stimuli affecting the anæsthetic area, but that if he will concentrate his attention on this area sensation will return. When the individual understands what he has to do, recovery of normal sensibility at once returns, and with the return of normal attention the abnormal resistance at the synapses disappears and the abolished cutaneous reflexes reappear.

THE SUPERFICIAL REFLEXES IN HYSTERIA.

There has been much controversy about the behaviour of the superficial reflexes in hysteria. Differences of opinion are in part due to insufficient knowledge as to the normal variations in the reflex under different physical conditions. My investigation on these subjects have been made principally in connexion with the abdominal reflex, but I shall also refer to some observations on the plantar reflex.

The Abdominal Reflex.

Authorities differ as to the frequency with which the abdominal reflex may be absent in normal individuals. A recent investigation by Söderbergh[3] on 700 normal individuals between the ages of 2 and 68 shows, however, that in favourable conditions it can almost invariably be obtained. It is important to adopt a proper method of examination before concluding that it is absent. It is particularly difficult to detect in individuals with much subcutaneous fat or flabby abdominal muscles. It is necessary to watch both for visible muscular contraction and for displacement of the umbilicus or middle line. The epigastric, upper, middle, and lower abdominal reflexes should be successively tested. The skin is lightly and rapidly stroked, and care is taken to observe the response to the *first* stimulus, as in many cases the reflex rapidly disappears on repetition. As the cause of this disappearance does not seem to have been investigated, I recently carried out some observations, with the help of Dr. W. Johnson and Dr. E. J. Wood, in order to determine the effect of varying physical conditions on the abdominal reflex in normal men.

The first problem to decide was whether the diminution in strength of the reflex on repetition is, as is generally supposed, the result of fatigue or whether it is due to some accidental coincident condition, such as the cooling of the skin which must follow exposure to the air. The latter proved to be the more important factor. In a man who showed an unusually brisk reflex when his abdomen was first exposed no reflex could be obtained after an interval of five minutes, the surface temperature of the skin having fallen from 33·6° to 31° C. in the interval. In a second case the skin on the left side of the abdomen only was exposed; measuring the reflex on a numerical basis from 0 to a maximum response of 6, it was found when tested at intervals of a minute to fall gradually from 3 to 1 at the end of the eighth minute, the surface temperature having fallen from 33·5° to 28° C. On now exposing the whole abdomen the reflex on the right side was found to be still 3 and the temperature 33·5° C.

The effect of the temperature of the skin was confirmed by comparing the reflex obtained on the two sides after one had been artificially warmed or cooled. The warmer side always had the brisker reflex. When the temperature of the two sides became gradually more equal as a result of exposure, the reflexes also became more nearly equal. Some inequality was still observed in one case with a difference of surface temperature as small as 1° C., though when it had fallen to 0·4° C. the reflexes were equal, but in another no definite difference could be seen after the temperature of the skin on the side which had been cooled had risen to within 2·5° C. of the other.

It is clear from these experiments that no accurate observations as to the effect of fatigue can be made until the temperature of the skin has fallen to a constant level, as otherwise it would be impossible to separate the effect of cooling from that of fatigue. When the temperature is constant we found that fatigue is only of importance if the skin is stimulated along exactly the same line on each occasion. If care is taken to stimulate different lines on each occasion there is no fatigue effect, however near the lines may be. But in the former case the effect of fatigue is very obvious.

In one experiment the temperature and reflex having fallen as a result of exposure from 35° to 30° C., and from 6 to 4 respectively, and then remained perfectly constant for a quarter of an hour, the reflex completely disappeared at the thirty-seventh stroke repeated along a line 2¼ inches

long in a period of 35 seconds. The reflex was, however, still as brisk as ever when tested on a line of equal length half an inch away on each side. It is clear, therefore, that the fatigue takes place in the peripheral sense organs and not in the reflex centre in the spinal cord. Although the effect of fall of temperature is always well marked, that due to fatigue may be very slight or even absent. Thus in one experiment no diminution in the response occurred after 35 repetitions along exactly the same line in the course of a minute.

The condition of the bladder was found to exert an unexpected influence on the reflex. In a boy whose bladder was filled to an extent that made him desire to micturate no abdominal reflex could be obtained, but directly he had passed 8 oz. of urine a brisk reflex was obtained.

In rare instances we observed variations in the reflex which we could not explain; thus a previously brisk reflex was occasionally found to have almost or completely disappeared after a short interval, though there had been no exposure and the bladder was empty.

Inequality of the reflexes on the two sides of the abdomen is often regarded as evidence of organic disease. But before any conclusion can be drawn it is clear that care must be taken to ascertain whether the surface temperature is approximately equal on the two sides. A patient who had been lying on one side with the lower side in contact with a hot bottle, or one in whom the bedclothes had been carelessly raised during the examination so as at first to expose one side only, would certainly have unequal abdominal reflexes, which might easily be regarded as of pathological significance, though really due to nothing more than the unequal temperature of the skin on the two sides.

Strümpell and Oppenheim regard the loss of the reflex as a valuable sign in early disseminated sclerosis; its almost constant presence in normal individuals makes its absence in doubtful cases distinctly important, but only as a confirmatory sign, as it is very rarely lost before other more conclusive evidence of lateral column disease, especially an extensor plantar reflex, is present. In a series of 50 cases of disseminated sclerosis examined with Dr. Johnson at Guy's Hospital in 1912,[4] we found that it was absent in 80 per cent., the plantar reflex being extensor in 82 per cent. on both sides and in 4 per cent. additional cases on one side. In future it will be advisable to warm the skin over the abdomen with a hot bottle, and to see that the bladder is empty before concluding that the abdominal reflexes are really abolished.

As in rare cases it is impossible to obtain one or both of the abdominal reflexes although the plantar reflexes are normal, it is very important to know whether the reflexes can be lost or become unequal in hysteria. Babinski has laid it down as a definite law that hysteria never leads to any alteration in the cutaneous or deep reflexes, and the majority of authors agree with him. Thus Williamson has recently emphasised the fact that the reflexes are never affected in hysteria as an aid in diagnosing hysterical from organic anæsthesia. A few writers have, however, expressed doubt on the question, and the following clinical and experimental observations prove conclusively that under certain conditions the abdominal reflexes may be unequal or lost in hysteria.

I have already described the case of Pte. M., the patient who had for nearly two years such complete anæsthesia and analgesia of his skin that no stimulus of any kind, including the strongest faradic current, produced the slightest sensation. The tone of the abdominal muscles was good, the patient was thin, and examinations were made repeatedly over a period of many months under varying conditions, but no abdominal reflex was ever obtained. When at last the patient began to use his left hand an attempt was made to restore sensation on the left side of his body by the application of a very strong faradic current with a wire brush. After several futile attempts the patient could at length just feel the stimulus on the left side, but the right side was still totally anæsthetic, and no smaller stimulus produced any sensation on the left side. The same day a definite abdominal reflex was for the first time obtained on the left side, but not on the right side. As sensibility gradually improved the left abdominal reflex became brisker. After several weeks had elapsed, the patient being now able to walk, cutaneous sensibility over the whole body very gradually reappeared without any special treatment. The right abdominal reflex was now obtainable, but it was very much weaker than the left, corresponding with the greater degree of anæsthesia.

We have thus in a single case an example of hysterical anæsthesia associated at one stage with complete bilateral loss of abdominal reflexes and at another with marked inequality of the reflexes of the two sides.

In 1907[2] I made several observations on anæsthesia purposely induced by suggestion in the waking state on patients suffering from hysterical paralysis. In a few cases I succeeded in producing a very profound hemianæsthesia on the paralysed side, and in these cases the abdominal reflex on the anæsthetic side was weaker than on the other side, and occasionally it was lost, although at the beginning of the experiment the reflexes were normal. When as a result of counter-suggestion the anæsthesia disappeared the reflex reappeared.

In these investigations a change in the reflex was only observed when the anæsthesia was very profound, and, corresponding with this, in the only case of hysteria I have seen in which the abdominal reflexes were affected when the patient first came under my observation, the anæsthesia was complete.

The Plantar Reflex.

The plantar reflex is affected by temperature in exactly the same way as the abdominal reflex, but as the feet are more liable to become cold than the skin over the abdomen the influence of temperature is of still greater importance. It is well known that absence of the plantar reflex is most commonly due to cold, and that a reflex which cannot be elicited at first may be obtained with more or less ease after restoring the circulation by exercise or the application of warmth. By noting the surface temperature we found that as it steadily fell on exposure the reflex became less brisk and finally disappeared. A very slight fall of surface temperature may be sufficient to produce a remarkable alteration in reflex activity; thus a moderately brisk reflex, tested at intervals of 60 seconds, became gradually weaker, and finally disappeared at the end of the fifth minute, the surface temperature having fallen only 2°—from 28° to 26° C.

The diminution and loss of the reflex occurs pari passu with the diminution in cutaneous sensibility, which is produced, as I have already pointed out, by the peripheral anæmia, caused by cold. The loss of the reflex is clearly due to the deficiency of the afferent impulses from the skin, which, under normal conditions, give rise simultaneously to the sensation of touch and to the plantar reflex. Apart from the cold feet from which healthy individuals suffer, the disuse resulting from paralysis, whether organic or hysterical in nature, is accompanied by diminished circulation and consequent cooling of the surface, with loss of the plantar reflex.

In the case I have already described of universal hysterical anæsthesia following stupor the plantar reflexes were, like all the other superficial reflexes, absent. On two occasions I exposed the patient's feet while he was asleep. Stroking the soles produced a brisk reflex, and he woke up at the same moment, having apparently felt the touch in his sleep. The return of sensibility in sleep was thus accompanied by return of the corresponding reflex. Immediately afterwards it was found that complete anæsthesia had returned and no reflex could be obtained. When many months later he recovered from his paraplegia the anæsthesia slowly but spontaneously disappeared, and at the same time the reflexes could once more be elicited.

It is clear, therefore, that profound hysterical anæsthesia of the sole of the foot may be accompanied by loss of the plantar reflex. This is quite independent of any change in the surface temperature, and must therefore be distinguished from the much more common loss of the plantar reflex caused by the coldness of the feet in hysterical paraplegia. In the absence of profound hysterical anæsthesia the reflex in these cases returns on warming the feet, just as it does in organic paraplegia if it cannot at first be obtained.

SENSIBILITY OF MUCOUS MEMBRANES.

(a) Conjunctival and Corneal Anæsthesia and Reflexes.

In a later lecture I shall refer to the historical case of Madame Stapart, who was cured of hysterical blindness of ten years' duration by a supposed miracle in 1728. The contemporary description of her case shows that the blindness which affected her left eye was accompanied by complete anæsthesia of the cornea, conjunctiva, and eyelids, with loss of the corneal and conjunctival reflexes, as the finger could be inserted between the lids without producing any sensation or movement. Directly she was cured sensibility returned together with the associated reflexes.

A similar anæsthesia was described by Charcot and others in association with hysterical blindness and more frequently with unilateral narrowing of the field of vision, the whole being part of a more or less complete hemi-anæsthesia. But none of the numerous patients with hysterical blindness whom I observed during the war complained spontaneously of any loss of sensibility of the eyeball or eyelids, and none showed any evidence of the inflammation which is liable to follow injury of an eye which has become anæsthetic as the result of an organic lesion, such as follows the treatment of

trigeminal neuralgia by injections of alcohol or removal of the Gasserian ganglion. In a small number of my cases, however, anæsthesia was discovered on careful examination. I believe that in these cases the anæsthesia was produced by unconscious suggestion on the part of the observer, as when great care was taken to avoid any possibility of this, no anæsthesia was found. A patient with one blind eye is likely to think that the eyeball will also be insensitive to touch if his attention is drawn to the subject, and he will probably include the eyelids in his conception of the eye as a whole, so that they too will become anæsthetic.

In every case in which I have observed hysterical anæsthesia of the conjunctiva and cornea, the corresponding reflexes have been absent and have returned with recovery of sensibility, the association being of exactly the same nature as that observed between cutaneous anæsthesia and loss of reflexes.

In the case of universal and absolute cutaneous anæsthesia following stupor, which I have already described, there was total loss of sensibility of the cornea and conjunctiva of both sides, although central vision at any rate was not affected. This case afforded a good opportunity of watching over a long period the slow restoration of sensibility and of corneal and conjunctival reflexes occurring pari passu.

(b) *Pharyngeal Anæsthesia.*

Pharyngeal anæsthesia appears to have been first described as a symptom of hysteria in 1872 by Anstie.[5] "Anæsthesia is very often found when looked for," he wrote, "in one situation where its presence is highly characteristic—the back of the pharynx. If a patient, not taking bromide, can, without retching, let you pass the finger well down to the epiglottis, the diagnosis of hysteria is exceedingly probable." The qualification concerning bromides was thought necessary on account of the observation of Huette in 1850 that the pharynx becomes anæsthetic and the pharyngeal and palatal reflexes disappear in patients taking bromide, an observation which has prompted many physicians to give the drug to patients before examining them with the pharyngoscope since the procedure was first suggested in 1867 by Gasselin. It can, however, be of little or no real value, as Krosz found in 1876 that it required an enormous dose, such as between 125 and 150 gr. taken at one time to abolish the pharyngeal reflexes, 100 gr. never being sufficient. My own observations also show that the supposed effect of bromide on the pharynx, which has been copied from book to book, is non-existent, as careful measurement of the pharyngeal excitability in ten cases of epilepsy before receiving bromide and after taking between 45 and 80 gr. a day, often for several weeks, in no single case produced any alteration.

The question is not merely of theoretical interest, as during the last few years I have seen many cases diagnosed as hysterical on account of the presence of pharyngeal anæsthesia. One neurotic young woman barely escaped with her life, because the discovery of pharyngeal anæsthesia led her physician to diagnose an attack of abdominal pain as hysterical in origin, although the delayed operation showed she was suffering from acute appendicitis. The presence of pharyngeal anæsthesia has often been mentioned in reports on war neuroses as an indication of their hysterical nature. It is clear, therefore, that the time has come to decide what value can be placed upon this supposed stigma of hysteria.

With the aid of Captain E. A. Peters and Major J. L. M. Symns, I[6] first drew up a scale of pharyngeal sensibility, beginning with 0, which indicates complete anæsthesia, and 1, which indicates deficient sensibility and absence of all pharyngeal reflexes, and passing up to 7, which indicates such an extreme degree of hyperæsthesia and such violent reflex spasms that it is quite impossible to examine the throat. After a few days' practice we found our standards were so definite that we always indicated the sensibility in a given case, examined independently, either by the same number or occasionally by numbers differing by one, but never by more. We then systematically recorded the sensibility in a large number of men, some healthy, some suffering from a great variety of surgical and medical conditions, and others from definite hysterical symptoms, the nature of which was always finally confirmed by their cure by means of psychotherapy. We made our examination without indicating to the patient what object we had in view. He was told to open his mouth, and the back of the pharynx and soft palate was then touched with some blunt object, the tongue being depressed when necessary. In the rare cases in which no reflex was produced the man was asked what he had felt during the examination. The accompanying curves show the pharyngeal sensibility in 170 individuals with no hysterical symptoms and 64 with hysterical symptoms. A third curve shows separately the cases of hysterical aphonia and mutism, which are also included in the second. We have analysed these, because it is often asserted that pharyngeal anæsthesia is particularly well marked in hysterical aphonia, just as hysterical anæsthesia is said—quite erroneously—to occur in the external ear in hysterical deafness, in the cornea, conjunctiva, and eyelids in hysterical blindness, and so on, assertions which we have found to have not the slightest foundation in fact.

Three Graphs to Illustrate Pharyngeal Sensibility in Hysteria.

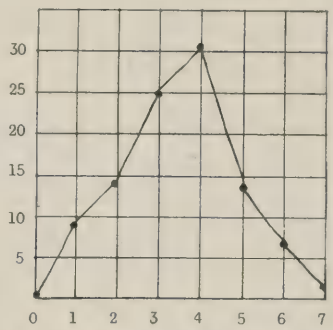

FIG. 1.—170 cases with no hysterical symptoms.

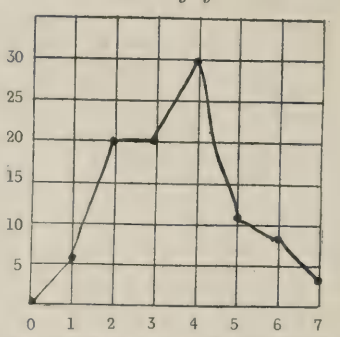

FIG. 2.—64 cases with hysterical symptoms.

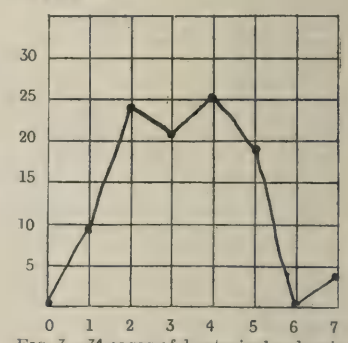

FIG. 3.—34 cases of hysterical aphonia or mutism.

Percentage of cases is given at the left and degree of sensibility at the foot of each chart.

In several cases of hysterical aphonia, as well as of other hysterical symptoms, it was found that the pharyngeal excitability remained unaltered after a cure had been obtained. The single case in which complete pharyngeal anæsthesia was present was that of a stolid individual, convalescent from neurasthenia due to simple exhaustion. He had had no hysterical symptoms and there was no history of hysterical manifestations in the past.

These figures show conclusively that pharyngeal sensibility is no more deficient in individuals suffering from hysterical aphonia or other hysterical symptoms, such as paralysis, contractures, fits, blindness, or deafness, than in individuals who neither are suffering nor have ever suffered in this way, and varies in a similar manner in different people. When care is taken to avoid suggestion, complete pharyngeal anæsthesia is hardly ever found, and the comparatively rare absence of reflexes is met with in normal people just as often as in patients with hysterical symptoms. Curiously enough, in the only example of organic disease in a series of 100 consecutive cases of aphonia in soldiers,[7] laryngoscopic examination was unusually easy owing to the extremely slight degree of pharyngeal sensibility. If pharyngeal anæsthesia had been taken as a sign of any value it would thus often have led to erroneous diagnosis.

These investigations were all made on soldiers, but I carried out a similar investigation on a large number of patients at Guy's Hospital a few years ago and obtained precisely similar results, although about half of the non-hysterical patients and nearly all the hysterical ones were

women. Unfortunately, the exact figures have been lost, but they did not differ in any way from the present series.

We may thus conclude that pharyngeal anæsthesia is not a stigma of hysteria, and that when it is habitually found by a given observer it must be produced in the majority of the cases by involuntary suggestion on his part. As most patients suffering from hysterical symptoms are abnormally suggestible, it is more likely to be found by careless examination in such individuals than in others. As many individuals suffering from organic disease are equally suggestible, pharyngeal anæsthesia may easily be produced in them. Conversely, in the not uncommon cases seen under the peculiar conditions of modern warfare, in which hysterical symptoms developed as a result of an overwhelmingly powerful suggestion in men who were not abnormally suggestible, pharyngeal anæsthesia would not be produced by careless examination, and the hysterical nature of the symptoms might be doubted if any importance were attributed to pharyngeal anæsthesia as a stigma of hysteria.

In order to explain the frequently repeated assertion that laryngoscopic examinations are particularly easy to make inpatients with hysterical aphonia, it must be remembered that about 25 per cent. of patients suffering from aphonia or other hysterical symptoms have, like a similar proportion of normal individuals, a comparatively insensitive pharynx (1 or 2 in our scale). The insensibility would not be remarked upon in a normal individual; but its association with hysterical symptoms would at once strike an observer who had been taught to regard pharyngeal anæsthesia as a stigma of hysteria, and the one case confirming this would make more impression on his mind than the three in which the pharynx was more sensitive. Moreover, our observations show how easily pharyngeal anæsthesia is produced by suggestion, and a few words of encouragement by the observer would be enough in many cases to render a previously sensitive pharynx insensitive, although the observer might have no notion that his words would have any such effect. In most individuals the pharyngeal sensibility remains unaltered on repeated examination, but in abnormally suggestible men, whether they are actually suffering from hysterical symptoms or not, we have frequently been able to reduce the sensibility from 3, 4, or 5 to 1 or 2 by direct suggestion.

(c) *Rectal Anæsthesia.*

The only other mucous membrane which requires brief consideration is that of the rectum, as numerous French writers, ever since Gendrin first referred to the condition in 1846, have regarded anæsthesia of the rectal mucous membrane as a cause of constipation. It is curious that not one of them should have taken the trouble to investigate the sensibility of the rectum in normal individuals. In my Goulstonian lectures on the Sensibility of the Alimentary Canal I described how I had found that the mucous membrane of the rectum is totally insensitive to tactile, thermal, and painful stimuli, so that whatever importance deficient sensibility of the muscular coat of the rectum may have in the production of dyschezia, anæsthesia of the mucous membrane is the normal condition, and neither a result of hysteria nor a cause of constipation.

CUTANEOUS HYPERÆSTHESIA.

If the view be accepted that the physical basis of attention to sensory stimuli is a diminished resistance at the synapses in the sensory tract involved, and that hysterical anæsthesia with the corresponding loss of reflexes is caused by inattention, it is easy to explain the occurrence of hysterical hyperæsthesia. When for any reason an individual's attention is fixed to an abnormal degree on sensations coming from a certain area of skin, the resistance at the synapses in the tract conveying impulses from this area to the brain is diminished to a greater extent than under normal conditions. It may be supposed that whilst ordinary attention results in a considerable degree of approximation of the dendrites of adjacent neurones at each synapsis, the excessive attention in hysterical hyperæsthesia results is still greater approximation owing to the extreme degree of projection of the dendritic terminations. Whereas the abnormally great resistance at the synapses in hysterical anæsthesia results in diminution or loss of the corresponding reflexes, the abnormally small resistance at the synapses in hysterical hyperæsthesia results in their exaggeration.

I do not propose to discuss the causes of hysterical hyperæsthesia at any length. But I should like to draw attention to the frequency with which cutaneous hyperæsthesia results from unconscious hetero-suggestion on the part of the observer in exactly the same way that hysterical anæsthesia so often arises. This is seen most frequently in connexion with the areas of cutaneous hyperæsthesia which are supposed to occur in association with visceral disease.

In my first enthusiasm for the brilliant investigations on the subject by Head, which I read as a student in 1903, I found that I could confirm his observations in every case which I examined. Being particularly interested in the cutaneous hyperæsthesia associated with digestive disorders, I acquired the habit of mapping out Head's area in every case diagnosed as ulcer and watching its retraction from day to day as improvement occurred until it finally disappeared, when it was assumed that the ulcer had healed. My first doubt on the subject arose when I had the opportunity in 1909 of seeing ten patients operated on by Moynihan for duodenal ulcer. I had examined them with great care the previous day and I had entirely failed to find any cutaneous hyperæsthesia, but the ulcer was none the less demonstrated in nine out of ten of the cases at the operation. From that time I have never been able to find any evidence of cutaneous hyperæsthesia in cases of gastric or duodenal ulcer, although I have repeatedly searched for it. Whereas the majority of my earlier cases had occurred among highly suggestible, chlorotic girls, who had up to that time been regarded by most physicians as particularly subject to gastric ulcer, Moynihan's patients were mostly middle-aged phlegmatic Yorkshiremen. With greater knowledge of the symptoms of ulcer and of the conditions which simulate it, and improved accessory methods of diagnosis with the aid of the X rays and chemical examination of the gastric contents and fæces, it has become recognised that chronic ulcers are comparatively rare among chlorotic girls, the very people who were formerly supposed to be most subject to them and in whom hyperæsthesia would be most easily suggested. In examining for hyperæsthesia it must be remembered that, unless the greatest care is taken to avoid the possibility of suggestion, it is very easy to produce hyperæsthesia in the area in which it is expected. When improvement occurs under treatment both the physician and patient expect the area to become smaller, and so indeed it does, but not as a result of the healing of the ulcer, but of the physician's hetero- and the patient's auto-suggestion. I have now many times suggested an area of hyperæsthesia away, replaced it by anæsthesia, or transferred it to the opposite side, after it had been carefully marked out by one of my clinical clerks. I have no doubt that the areas of hyperæsthesia had been suggested, just as I had suggested similar areas before I learnt how to avoid doing so.

I do not mean that Head's areas are always the product of suggestion on the part of an observer, looking for hyperæsthesia in a certain zone in a patient who is unduly open to suggestions of the kind owing to abnormal suggestibility and to the presence of symptoms, such as pain, which draw his attention to the area as the probable seat of disease. But I believe that they occur so rarely in diseases of the œsophagus, stomach, intestine, liver, and pancreas as to be of no diagnostic value. Only in diseases of the kidney, which lead to distension of the pelvis, does true cutaneous hyperæsthesia appear to be of some frequency; but even in these conditions the areas of skin involved are much less constant than is often supposed.

It is interesting to note that when these areas of cutaneous hyperæsthesia, unconsciously suggested in the way I have described, are unilateral, the abdominal reflex obtained from the suggested area is brisker than that on the other side, confirming the view I have advanced of the physical basis of hysterical hyperæsthesia. The reflex becomes normal once more when the hyperæsthetic area disappears as a result of suggestion.

HYSTERICAL PAIN.

It is a matter of common experience that pain is increased by attention and diminished by inattention. In all probability individual variations in sensibility to pain depend largely upon the varying ease with which the attention can be diverted by an effort of will from the seat of pain. The anatomical basis I have suggested as an explanation of variations in cutaneous sensibility

to tactile stimuli can probably be extended to explain variations in sensibility to pain. In this connexion I have already referred to the hysterical analgesia which is often associated with hysterical anæsthesia. In the converse condition an individual may be unusually sensitive to pain owing to his inherited mental characteristics, or he may become so owing to exhaustion, insomnia, and sepsis, and the demoralisation which prolonged and excessive pain may induce. This acquired sensibility to pain was comparatively common in soldiers. A man may train himself to such an extent to feel pain that the diminished resistance at the synapses in the tract conveying painful impulses to the brain may persist after the primary cause of pain has been removed. The persistent pain is hysterical, being suggested by the original organic pain, and being curable by psychotherapy.

A patient may continue to feel pain after his diseased appendix has been removed as the result of very slight painful impulses produced in the deep tissues and scar, which an average individual would ignore. The following is one of several cases of the kind which I have observed both in soldiers and civilians.

Hysterical pain following appendicectomy cured by psychotherapy.—Pte. G., aged 24, had had over two years' active service in France and Italy when he developed an acute attack of appendicitis on July 6th, 1918. He was operated upon the same night, two tubes being inserted. He was transferred to a hospital in England, and was allowed to get up on August 16th. Since then he had had constant sharp pain in the region of the scar. He was sent to his depôt and told that the pain would go in time. He was given clerical work, but could not do it, and was transferred to Seale Hayne Hospital under Captain S. H. Wilkinson on Dec. 21st, 1918. He complained of constant pain in the region of the scar, especially when in bed. In a long therapeutic conversation it was explained to him that the original pain had made a great impression on his mind, because at the time he was physically and mentally tired from constant active service for over two years; in spite of the fact that the cause of the pain had gone, his mind had got so accustomed to feeling the pain that he continued to feel it. The pain disappeared completely, and two days later he was given work on the farm. There had been no return of pain when he was discharged a month later.

The pain felt in the scars of wounds long after they have healed is, I believe, in many instances of the same nature. It has generally been ascribed to nerve fibres becoming involved in scar tissue, but nothing abnormal may be found at operation, or complete excision of the scar may produce no improvement, the pain persisting in the new scar. We saw numerous cases of this kind, which were often associated with hysterical paralysis or contracture, in which severe pain was rapidly cured by psychotherapy.

It is generally assumed that the headache following the explosion of a shell in the immediate neighbourhood, especially if consciousness was lost, is due to concussion. If this is correct, so-called "shell shock headache" is of exactly the same nature as the headache which follows concussion in civil life. It is well known that the most effective treatment of the latter is rest, but that if insufficient rest is taken in the earliest stage the headache is likely to be prolonged for an indefinite period. This has proved to be the case in "shell shock headache," and all who have had such cases under their care must have been struck by the extreme difficulty of relieving the headache by ordinary means. The analgesic drugs, which give at any rate temporary relief for most forms of headache, are either entirely without effect or only produce a slight amelioration of the pain. If a considerable period has elapsed since the onset of the headache, during which the patient has been getting about, a renewed period of rest is generally of comparatively little use. In a number of cases we were struck by the complete relief which immediately followed a lumbar puncture, but unfortunately this was rarely permanent and often only lasted for a day or two. We were at the time unable to explain this, as the fluid was never under increased pressure, so that it did not seem possible that the improvement was due to the reduction of an abnormally high intracranial pressure.

The following case seems to give a clue to the explanation of the persistence of the headache in some of these cases:—

"Shell shock headache" cured by hypnotism.—Cpl. H. served from August, 1914, and remained well until he was blown up in November, 1917. He was away from his unit for a month on account of a stammer and tremor. He then returned to duty, but was wounded in April, 1918. He was now sent to hospital, and after six months' treatment for neurasthenia was admitted to Seale Hayne Hospital under Captain C. H. Ripman in October, 1918. He was shaky and complained of a heavy pain in the head during the day, which had been present ever since he was blown up. During the whole night he sat up in bed holding his head and crying with pain. In spite of the severity of the pain he was not inclined to make much of it during the day. He was treated with drugs, none of which had any effect. Hypnosis was consequently tried. The headaches improved at once. After the first treatment he slept through the night and he had no headache the next day. After three treatments he felt perfectly well and became one of the most lively men in the ward, having previously spent all day curled up on his bed and all night crying with pain. He was discharged a month later and wrote in February, 1919, to say that there had been no return of his headache.

In this case, in spite of the extreme severity of the headache, complete relief was produced by suggestion without any accessory factor coming into play. It is inconceivable that suggestion, by which is meant the communication of a proposition without giving adequate and logical grounds for its acceptance, could have produced such a result in a headache of organic origin. Consideration of this case points to the possibility that the relief produced in our earlier cases by lumbar puncture was due to suggestion, and the absence of any relief with ordinary analgesic drugs could be explained on the assumption that the headache was of entirely psychical origin. It is probable, therefore, that the explanation of the long-continued and intractable headache following the concussion caused by a high-explosive shell is due to the perpetuation by auto-suggestion of a headache, which is at first organic in origin and a genuine result of concussion. Being produced by suggestion and cured by psychotherapy, it can be correctly called hysterical.

The chronic headache which follows concussion in civil life is probably often of similarly hysterical origin.

Hysterical headache following concussion.—A lady, 49 years old, an artist by profession, fell on her head in February, 1917, as the result of a collision with a motor lorry whilst she was driving a dogcart. She was badly shaken, but was not rendered unconscious. Severe headache developed immediately afterwards. It persisted all day, and at night prevented her sleeping. She did not improve in spite of wearing spectacles for astigmatism and giving up painting and reading since her accident. In October, 1918, she was told that the pain was rheumatic, and was ordered a strict diet and massage for her head. After this she became terrified of cold and damp, and kept indoors almost all the time, but whenever the weather was bad the headache was much aggravated, although this had not hitherto been the case.

I saw her for the first time on March 1st, 1919, when I explained to her that the headache was simply a perpetuation of that due to the original concussion. I told her that as the effects of the latter had long ago passed away she would no longer have any headache if she ceased to expect it. I explained to her that it was clearly not due to her astigmatism, as her glasses had not helped her, and she was no better when she did not read or paint, and that the failure of her dietetic precautions and staying indoors had proved that it was not rheumatic. On my advice she gave up her glasses and began to read and paint, and she went out whatever the weather was like. I saw her a week later and she had only had one slight headache, which had come on during a rainstorm, this having been apparently again suggested by the weather. Further explanation resulted in complete disappearance of the headache in spite of taking no further precautions to prevent it. She was given no drugs, and the various medicines she had taken before both during the day and at night for her insomnia were discontinued. From the first conversation she slept perfectly well. She wrote on April 16th to say she was still free from headache.

Hysterical pain is a very real thing and cannot be distinguished from pain caused by organic disease by its character or by the absence of associated sympathetic phenomena. It may, for example, give rise to tachycardia, dilatation of the pupils, pallor, and sweating, if the original organic pain did so, because the afferent tract of the reflex paths involved offers so little resistance to impulses excited by peripheral stimuli that the latter still produce marked effects, even if they are so slight that if the patient would cease to expect pain and so allow the normal resistance to return, they would either produce no effect at all or only an insignificant amount of pain and little or no sympathetic reflexes.

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SYMPTOMLESS INFLUENZAL (STREPTOCOCCAL) MASTOIDITIS.

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THE possibility of the occurrence of a very acute mastoiditis, with few, if any, of the usual symptoms, was first brought to our notice by several cases in which the original condition was deduced by tracing back the undoubted steps of development of the complication which was the first recognisable feature. The sequelæ which we were called upon to treat in our three original cases were lateral sinus thrombosis, peri-sinus abscess, and extra-dural abscess, all three unexpectedly appearing without any of the usual signs or symptoms of mastoiditis. Fortunately, we were enabled to supplement this experience by the study of a minor epidemic of influenza, with middle-ear complications, occurring amongst the staff of a large institution in which we were able closely to watch the progress of the disease.

Noteworthy Features.

The first cases followed, almost exactly, the course of our original three, and displayed the following noteworthy features:—

1. A very acute onset of earache occurring in the second or third day of a mild influenzal attack comprising pyrexia, malaise, coryza, and pains in the trunk and limbs.
2. The upper part of the drum was generally alone affected, displaying redness and bulging from the beginning.
3. Perforation occurred early, followed by unusual hæmorrhage lasting for several days, accompanied by complete relief of all pain.
4. The posterior meatal wall became red and swollen shortly after the appearance of the discharge.
5. The discharge, at first slight, became in the second or third day profuse, coinciding probably with mastoid suppuration.
6. After perforation, other than discharge, there were no symptoms. That is to say, no pain, pyrexia, increase of pulse-rate, mastoid tenderness, or malaise.
7. On opening the mastoid, which was invariably of the pneumatic type, the chisel exposed softened, red, marrow-like bone, which showed early necrosis and absorption with the formation of large cavities full of pus. The extension was generally downwards and backwards.
8. The incomplete operation was performed in all cases, although in several the so-called "bridge" had already suffered necrosis.
9. The subsequent progress was unusually rapid and uneventful, and in no case has the hearing been appreciably affected.
10. In all cases streptococci of the hæmolytic influenzal type were found in large numbers.

Record of Cases.

To save repetition in the description of the cases we have omitted details of symptoms, onset, &c., unless they in any way diverge from the typical form as already set forth.

CLASS A.—*Comprising five cases. First seen late in the course of the disease. Complications found at operation.*

(1) Boy, aged 13. Seen three weeks after typical onset. Temperature 105° F. at night, subnormal in morning. Drum and meatal appearances as described. Slight discharge. No other symptoms. *Operation.*—Lateral sinus thrombosis. Large peri-sinus abscess. Internal jugular vein tied. Recovery after three weeks of septicæmia with normal hearing. Streptococci isolated from pus, thrombus, and blood culture.

(2) Man, aged 54. Seen seven weeks after typical onset. Discharge profuse. Drum and meatal appearances as described. Patient doing his usual work on the Stock Exchange. *Operation.*—(1) Incision of drum, no diminution of discharge. (2) Next day antrum opened. Large peri-sinus abscess extending from bend to bulb. Sinus not thrombosed. So-called "bridge" much eroded. Middle ear left intact. Uneventful recovery with normal hearing.

(3) Man, aged 62. Seen three weeks after typical onset. Discharge profuse. Signs as described. Operation refused at first as patient felt "perfectly well." *Operation.*—(1) Incision of drum. (2) Incomplete operation (four weeks from onset). Large subdural abscess. Definite area of necrosis close to promontory. Facial palsy third day after operation, disappeared one week later. Progress uneventful. Hearing normal.

(4) Girl, aged 9. Seen fourteenth day after ordinary onset. Obviously ill, with vomiting and rigors. Signs as described. Discharge profuse. No symptoms until onset of septicæmia. *Operation.*—Large peri-sinus abscess. No apparent thrombosis. Internal jugular tied two days later on recurrence of rigors. Death on fifth day after admission to hospital. *Post mortem.*—General bacterial pyæmia with no large infarcts.

(5) Girl, aged 14. Seen 14 days after typical onset. Discharge very profuse from both ears. Much deafness and slight earache. Drum and meatal appearances only slightly suggestive. Watched for four days. *Operation.*—As discharge was increasing. Left side: Large peri-sinus abscess. Right side: Mastoiditis; pus in antrum and cells. Discharged in five weeks. Hearing excellent.

CLASS B.—*Six cases operated on before onset of complications.*

(1) Sister. Seen ten days after ordinary onset. More pain than usual, as the perforation was constantly healing, leaving pus under tension. Incision of drum on two occasions. *Operation.*—Pus found throughout a very pneumatic mastoid. Aditus much eroded. Progress uneventful. Hearing good.

(2) Nurse. Seen seventh day. Typical onset, symptoms, and signs. *Operation.*—Free infection of pneumatic mastoid. Progress uneventful. Hearing normal.

(3) Sister. Seen 14 days after typical onset. Course complicated by empyema of maxillary antrum on the same side. *Operation.*—Extensive mastoid infection. Progress slow but uneventful. Normal hearing.

(4) Nurse. Seen four days after onset. Large perforation of lower quadrant of drum. Slight redness of posterior meatal wall. Watched for 14 days with apparent improvement. Sudden increase of discharge, with simultaneous bulging of posterior meatal wall. *Operation.*—Free infection of very pneumatic mastoid. Aditus carious. Progress satisfactory. Hearing only moderate.

(5) Nurse. Seen second day. No discharge. Slight bulging of upper quadrant of drum and meatal wall. *Incision* resulted in slight discharge. Increase of meatal bulging and quantity of discharge. *Operation.*—Pneumatic mastoid full of polypoid granulations. Erosion of aditus. Progress satisfactory.

(6) Girl, aged 11. Seen fourteenth day. Typical case. *Operation.*—Pus throughout mastoid. Antrum and aditus carious. Progress uneventful. Hearing normal.

CLASS C.—*Cases seen from first onset (four cases).*

(1) Boy, aged 11. Seen in first 24 hours. Appearances typical. *Operation.*—Third day. Large carious antrum communicating with lateral sinus. Progress uneventful.

(2) Nurse. Seen in first 24 hours. Typical. *Operation.*—Third day. Large antrum with purulent contents. Swollen mucosa, but no pus in mastoid cells.

(3) Nurse. Seen second day. The perforation in this case occurred on the second day, and was not, as usual, in the drum, but *at the apex of the swelling of the posterior meatal wall.* A probe could be passed through this perforation into the antrum. This occurrence illustrates the mechanism of the production of the meatal swelling. *Operation.*—Third day. Antrum freely infected. Aditus eroded.

(4) Boy, aged 10. Seen 12 hours after onset of earache. Semi-comatose. All signs of basal meningitis. Drum bulging in upper quadrant, but no perforation. Redness of posterior meatal wall. *Operation.*—Large subdural abscess, with extensive gangrene of dura. Condition of patient forbade further operation. Death 20 hours later. *Post mortem.*—Whole cisterna basalis full of thick yellow pus, connected with antrum by track leading through hole in roof of antrum.

Importance of Early Recognition.

The fact we particularly wish to emphasise is that after perforation the patient was apparently proceeding satisfactorily, being free from all symptoms and often able to resume his ordinary pursuits until one or other of the dangerous sequelæ arose. Hence the importance of the early recognition of the only sign we have found to be constantly present—namely, the redness and swelling of the upper drum and postero-superior meatal wall, together with the continuance, and especially the increase, of the discharge in a case of otitis media following influenza.

We have classified our cases into three categories: (*a*) Cases not recognised until the occurrence of dangerous sequelæ; (*b*) cases seen shortly after the appearance of the discharge; (*c*) cases followed from the onset.

This arrangement more or less represents our progressive knowledge of the disease, and we have little hesitation in believing that if the cases in Class C had not been treated when they were they would have run the grave risk of following the same course as those in Class A.

In Class B it will be noticed that we attempted on several occasions to forestall the onset of mastoiditis by incision of the drum. Except in one case, which is not recorded, our efforts were unsuccessful.

THE CLASSIFICATION OF PULMONARY TUBERCULOSIS.

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IN selecting a suitable classification for pulmonary tuberculosis one must bear in mind the objects of the classification.

Methods of Classification.

From the point of view of one arranging museum specimens a basis of morbid anatomy is clearly indicated, and one would found the classification on such changes as excavation, caseation, or the amount of lung involved. This is an unsuitable method when dealing with the living subject. Not only is it difficult to determine clinically how much lung is involved and exactly in what condition the lung is, but the extent of the disease, and more especially the anatomical stage, are often poor indications of the condition of the patient. For instance, excavation, a late stage in the morbid anatomy, is often found in most satisfactory cases.

A classification based on the systemic disturbance is more useful for the clinician. This may be combined with the anatomical changes which accompany the disease, as in the classification of Sir Robert Philip.

The Turban classification which is based on morbid anatomy may be modified (as suggested by Meissen) by the addition of the letters F or f to denote severe or slight pyrexia.

Dr. A. C. Inman's classification is based on pyrexia, and he divides the cases into: (1) resting febrile; (2) resting afebrile, ambulant febrile; (3) ambulant afebrile. This classification has the great advantage of being simple, definite, and not dependent on the opinion of the examining physician. It does not, however, differentiate between the fever found in early cases and that found in late, nor can one easily place the large number of chronic cases who have occasional bouts of fever but live a long time and get into an advanced stage of the disease with little or no pyrexia.

Dr. R. C. Wingfield has modified the Inman classification by adding letters to indicate the patient's fitness for work. This certainly gives a better picture of the patient's condition.

Stages in Life-history of a Consumptive.

A classification might well be based on the vital capacity constants as worked out by Professor G. Dreyer, and by this means one could define the exact condition of the patient. One could say he was so much per cent. below normal. This method seems to me to be of the greatest value, but to employ it as a standard method of classification at present is open to several objections. It does, however, enable one to follow the life-history of the patient.

If we follow the life-history of a consumptive from the time when the disease is first recognised until the end we find three distinct stages.

In the first the patient is receiving institutional treatment with a view to improving his condition or curing the disease. Sooner or later the patient reaches the second stage, when, having received as much benefit as possible from institutional treatment, he returns home and probably to work. He usually requires no special treatment, though he may be kept under observation at some out-patient department, and perhaps have some symptomatic treatment. He may require some special treatment, such as tuberculin or artificial pneumothorax, but this is now carried on whilst he is outside the institution. Then comes the third stage, when he begins to lose ground, and although the progress of the disease is often not a gradual decline, but consists of periods of ill-health alternating with periods of slight improvement, it is found that every six months the patient is worse.

Suggested Classification.

The classification I suggest is based on this life history. The first stage, A, is subdivided into (1) the hospital stage, and (2) the sanatorium stage.

The hospital stage includes patients in whom pulmonary tuberculosis has just been diagnosed and who require observation in hospital or in bed at home to enable the physician to determine the proper treatment and to see the patient's response to treatment. It may be regarded as the stage of initial rest. If the patient improves sufficiently to stand a sanatorium life he passes into the sanatorium stage. Here the patient remains until he reaches the stage of maximum improvement. He then passes into the second stage, B. This includes all patients who, having received the maximum benefit from institutional treatment, are holding their own, but in whom the disease is not arrested.

Stage 3 is the stage of decline, and includes patients who are losing ground in spite of treatment.

These stages are subdivided as follows:—

A. *Stage of institutional treatment.*—1. *Hospital stage.* α. In bed, or up less than two hours a day. β. Up from two to six hours a day.

2. *Sanatorium stage.*—α. Capable of less than half a day's work. β. Capable of half a day's work. γ. Capable of a full day's work.

B. *Stage of maximum improvement.*—1. Capable of a full day's work. 2. Capable of part-time work. 3. Unable to work.

C. *Period of decline.*—1. Able to do some work. 2. Unable to work. 3. Bedridden.

Discussion of Method.

When, therefore, the physician first diagnoses pulmonary tuberculosis he classifies the patient A 1 α. Whether the treatment is actually given in hospital or in the patient's private house does not matter. Possibly the patient is found to have acute tuberculosis and rapidly gets worse; in this case he would, of course, come into Class C 3. On the other hand, it may be found that he can pass quickly through Classes A 1 α and A 1 β, and is suitable for sanatorium treatment. The hospital stage is therefore that period of the disease during which the physician can observe the patient's response to treatment, and can decide whether he is fit for sanatorium treatment or not, and if fit, for which sanatorium he is best suited. If he is not fit he goes into Class B or Class C.

It may be thought that Class A could better be subdivided without the terms hospital and sanatorium. The names may be misleading, for many a sanatorium has a hospital side, and some hospitals give what is practically sanatorium treatment. I think, however, that the subdivisions are important. The true functions of hospital and sanatorium are entirely separate, and this subdivision serves a useful purpose if it emphasises the importance of the initial stage of rest and observation, a stage so often forgotten. Many a patient is hurried into a sanatorium when the correct treatment is rest, and often the wrong sanatorium is selected because the period of observation has been ignored.

Some patients in B Class may sooner or later require further institutional treatment with a view to patching them up again. Such cases should, I think, be classified B 3, and the words hospital or sanatorium added to distinguish them from the ordinary B Class, where no institutional treatment is required, and from those who are having institutional treatment in the early or A stage. This would not be such a large group as one might suppose, for it is usually found that such breakdowns are the beginning of the stage of decline. Thus, one would write B 3 Sanatorium, or B 3 S. After a short time one could decide whether the case should belong to the C Class or could be restored to the ordinary B Class again.

Advantages of Method.

In this classification there is no place for doubtful cases. Such cases are best referred to as cases for diagnosis. In a classification of any disease obviously no case should be included until it has been proved to be a case of that disease.

Similarly, if the disease is cured it cannot be included, and such cases are best referred to as arrested cases. If the disease breaks out again then the patient can once more be classified.

I have entirely ignored physical signs, but there is a chest diagram in all report sheets on patients, and a glance at these will give a more accurate idea of the amount of disease than any classification based on anatomy.

The classification I have suggested is simple and avoids matters about which there can be much difference of opinion. It enables one to classify an early case with no physical signs; for instance, after hæmoptysis with T.B. present. One can also distinguish between the good case with severe signs and the bad case with few, and between the A 1 α and C 3 cases, both of which are bed cases. Moreover, one can follow the course of the disease. For example, if one received monthly reports of a patient and found after six months the following classifications, A 1 α, A 2 α, A 2 γ, A 2 γ, A 2 γ, B 1, B 1, one could at once see that the patient has soon gone to a sanatorium where he did well, and that after some three months still had active disease, but was keeping at full work.

SULFARSENOL IN THE TREATMENT OF SYPHILIS,

WITH SPECIAL REFERENCE TO ITS ADMINISTRATION BY HYPODERMIC INJECTIONS.

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SULFARSENOL is a French preparation, manufactured by M. R. Pluchon at his bio-chemical laboratory in the Rue Michel Ange, Paris. It has the formula—$C_{12}H_{11}As_2N_2CH_2OSO_2Na$, and is a pale yellow, finely-divided powder, smelling rather like galyl. It dissolves very easily in water, making a very stable neutral solution.

Notes from Latest French and Belgian Literature.

(*a*) MM. Levy-Bing, Lehnhoff-Wyld, and Gerbay have given a large number of injections by the intravenous, intramuscular, and subcutaneous routes. By the last method they have given doses of 0.12 g. and 0·18 g. in 1 c.cm. distilled water.

(*b*) MM. Yernaux and R. Bernard, of Brussels, have studied the methods of subcutaneous injections.

They make a solution of the strength of 0·06 g. per c.cm of distilled water, and have injected at one time as much as 1·20 g. in 20 c.cm. of distilled water. The largest amount given by them in one month without any sign of intolerance has been 12 g. For intramuscular injections they at first dissolved the drug in a glucose mixture, but distilled water was found to be better, as the sulfarsenol was easier to dissolve, the solution was less sticky, and the results were equally good.

Their method of injection was as follows. Starting with 0·12 g. to 0·18 g. to test the susceptibility of the patient, the dose was rapidly increased to 0·3 g., 0·48 g., and 0·6 g., giving not more than 0·3 g. into one buttock. As the patients complained of having an injection into both buttocks on the same day, the full dose was injected into one. Later on they arrived at the fair-sized dose of 0·6 g. in 1 c.cm. of distilled water in one buttock every 6–7 days. Some of the injections seem to have been painful; sometimes pain was complained of at the site of the injections, at other times down the thigh or in the foot. Numbness was caused in a few cases. In from 6 to 10 hours these sensations usually disappeared suddenly, and did not interfere with walking or stop the patient from working. Rarely was he unable to carry out his occupation on the day following the injection. The results of using local anæsthetics, such as novocaine or stovaine, were not good.

The injection of these very concentrated solutions did not cause many reactions, either local or general. All the primary sores on the penis healed 24 or 25 days after 2 g.; chancres of the lip in from 25 to 30 days.

In summing up, they state that sulfarsenol is equal to, if not better than, N.A.B. Sores heal up quickly and the induration and enlargement of the glands rapidly disappear. It is equally useful in secondary syphilis. They state that in tertiary syphilis it acts as quickly as N.A.B. They had no Herxheimer reaction in any of their cases. It was unusual to find the *Spironema pallidum* in the sore on the day after the injection, and it was never found on the third day. After a total of 4 g. at most these workers have obtained a negative Wassermann. One of their patients had two slight nitritoid crises, showing that they are not caused by intravenous injections, but are due to arsenic, and can be produced without a Herxheimer reaction. They also got good results in acute and chronic eczema, a stubborn psoriasis, and a Vincent's angina.

M. Galonnier has shown that the elimination of arsenic was nearly the same when sulfarsenol was administered intramuscularly as intravenously.

The Method Employed: Efficacy of Treatment.

After reading the latest French and Belgian literature on this drug, and finding that injections dissolved in 10 c.cm. of distilled water were comparatively painless, I decided to try to decrease the amount of fluid, and were in a short time giving 0·42 g., 0·48 g., and 0·6 g. dissolved in 8 to 10 minims of distilled water practically painlessly.

The following was the technique employed. The ampoule is filed through evenly half-way up the neck. From 8 to 10 minims of distilled water is injected into the ampoule with a hypodermic syringe. A thumb is then placed over the opening and the ampoule is well shaken until the drug is completely dissolved; this only takes a few seconds. The fluid is then sucked up into the syringe and injected through a hypodermic needle into the loose skin of the forearm and the site gently massaged.

The spironema is present in the sore on the day following the injection, sometimes on the second day, but never on the third day.

In all cases the juice from the sore or rash has been examined daily under the dark ground, using an Edison and Swan "Pointolite," until the sore has healed or the rash has faded.

The results are about the same as we obtained in primary and secondary syphilis with silver-soda salvarsan. In tertiary cases, especially if ulcerated, the latter drug appears to be the best. Up to the present all sores have been completely healed after the third injection, usually after the first or second.

A few cases, contrary to the experience of the French with this drug, have shown a Herxheimer reaction, but only a very slight and transitory one. In one case, with a very faint early roseolar eruption on the day following the injection of 0·48 g. sulfarsenol hypodermically, the rash was much more marked and looked as if it had been painted on. On the next day the rash was completely gone.

In one case of a man with a relapse after six injections of kharsivan intravenously and five intramuscular injections of mercury in 1917, with large condylomata and sores on his penis and scrotum, the condylomata had gone and the sores completely healed six days after the first injection of 0·42 g. sulfarsenol hypodermically.

In all our cases so far the Wassermann has been negative after the fifth injection, with a total of from 2·2 g. to 2·4 g. of sulfarsenol.

Mercury was given in all cases, although probably not necessary in cases with a negative Wassermann, which remain negative from five to ten days after the first injection. It will take some time to prove whether or no cases will relapse more readily after treatment with this drug than with "606" or "914," as happened in the case of galyl.

Summary.

Sulfarsenol appears to be equal to any other form of salvarsan or neosalvarsan except as regards speed of disappearance of the *Spironema pallidum*, at any rate in primary and secondary cases. The hypodermic method of admininstration is foolproof and practically painless. It seems an ideal method for infants and those with difficult veins. Up to now I have had no side-effects, not even a slight rise in temperature; the usual contra-indications do not appear to be applicable in anything like the same degree as "606" or "914."

Intramuscularly it is less painful than "914," and can be given dissolved in distilled water. Intravenously the slightness of the Herxheimer renders less danger in cases with central nervous symptoms.

I have also used this drug intravenously in acute gonorrhœal epididymitis. One large or medium-sized dose appears to cause more pain shortly after the injection, but in two days the pain has completely gone. With two small injections at two days interval the results were wonderful. I tried 0·12 g., and 48 hours afterwards 0·18 g. The day after the second injection all pain had gone, and the testicle could be freely handled and even squeezed without any complaint from the patient.

Notes of Seven Cases Treated with Sulfarsenol.

IM. = intramuscularly; SC. = subcutaneously; HD. = hypodermically.

CASE 1.—Indurated papulo-erosive sore on left side of prepuce, inguinal glands enlarged on both sides. Wassermann ++ *S. pall.* present on day of injection, none found next day.
13/3/20: Sulfarsenol 0·54 g. IM. Inj. hyd. gr. 1 IM.
19/3/20: Sulfarsenol 0·6 g. IM. Inj. hyd. gr. 1 IM.
26/3/20: Sulfarsenol 0·54 g. IM. Sore healed. Inj. hyd. gr. 1 IM.
9/4/20: Sulfarsenol 0·54 g. IM. Inj. hyd. gr. 1 IM.
16/4/20: Sulfarsenol 0·54 g. subcutaneously in 8 minims distilled water.
18/4/20: WR. −. Total 2·76 g. sulfarsenol.
23/4/20: Rest.
5/5/20: Sulfarsenol 0·42 g. hypodermically. Inj. hyd. gr. 1 IM.
12/5/20: Sulfarsenol 0·48 g. HD. Inj. Hg. gr. 1 IM.

CASE 2.—Chancre on left side of glans penis with an indurated sore in coronal sulcus. Much inguinal adenitis. WR. + + *S. pall.* present on day of injection, absent next day.
5/3/20: Sulfarsenol 0·48 g. IM. Inj. hyd. gr. 1 IM.
12/3/20: Sulfarsenol 0·54 g. IM. Inj. hyd. gr. 1 IM.
19/3/20. Sulfarsenol 0·6 g. IM. Sore healed. Inj. hyd. gr. 1 IM.
26/3/20: Inj. hyd. gr. 1 IM.
13/4/20: WR. −. Total 2·04 g. sulfarsenol.
14/4/20: Sulfarsenol 0·42 g. IM. Inj. hyd. gr. 1 IM.
28/4/20: Sulfarsenol 0·48 g. hypodermically.

CASE 3.—History of primary syphilis June, 1917. Had six injections of kharsivan and 5 of mercury. Admitted with secondary sores on skin of penis and scrotum. Large condylomata round anus. Inguinal and general adenitis. No sign of primary sore. WR. ++. C.S.F. ++±. Globulin nil. *S. pall.* present in sores and condylomata for two days after first injection, but not present on the third day. Five days after the first injection the condylomata had healed. Two days later the sores had quite healed and the glands in groin very much smaller.
12/5/20: Sulfarsenol 0·49 g. HD. Inj. hyd. gr. 1 IM.
19/5/20: Sulfarsenol 0·42 g. HD. Inj. hyd. gr. 1 IM.
26/5/20: Sulfarsenol 0·6 g. HD. Inj. hyd. gr. 1 IM.
2/6/20: Sulfarsenol 0·6 g. HD.
6/6/20: Inj. hyd. gr. 1 IM. WR. ++.

CASE 4.—Sore noticed three months before admission. Several primary sores on prepuce and skin of penis. Early erythematous rash chiefly on chest, slightly on arms and back. Throat injected and mucous patches on tonsils. WR. ++. *S. Pall.* present in large numbers on day of injection, also found on first and second day after, not on third day. Slight Herxheimer reaction in rash and round mucous patches on the day after the first injection, but gone on second day.
30/4/20: Sulfarsenol 0·42 g. HD. Inj. hyd. gr. 1 IM.
7/5/20: Sulfarsenol 0·42 g. HD. Inj. hyd. gr. 1 IM.
7/5/20: Sores healed, rash gone. C.S.F. − − −. No globulin. No cells.
14/5/20: Sulfarsenol 0·6 g. HD. Inj. hyd. gr. 1 IM.
21/5/20: Inj. hyd. gr. 1 IM.
4/6/20: Sulfarsenol 0·6 g. HD.
8/6/20: WR. −. Total sulfarsenol 2·04 g.

CASE 5.—Chancre in meatus, induration running down right side of fossa navicularis. Glands in groin enlarged. WR ++. *S. Pall.* present, none seen after the first injection.
22/3/20: Sulfarsenol 0·42 g. IM. Inj. hyd. gr. 1 IM.
29/3/20: Sulfarsenol 0·42 g. IM. Sore healed, only slight induration. Inj. hyd. gr. 1 IM.
12/4/20: Inj. hyd. gr. 1 IM.
19/4/20: Sulfarsenol 0·48 g. SC. in 10 minims of distilled water. WR. ++. Inj. hyd. gr. 1 IM.
26/4/20: Sulfarsenol 0·54 g. HD. Inj. hyd gr. 1 IM.
3/5/20: Rest.
6/5/20; WR. $\underline{+}$ (weak negative). Total 2·34 g. sulfarsenol.
10/5/20: Sulfarsenol 0·48 g. HD. Inj. hyd. gr. 1 IM.
17/5/20: Sulfarsenol 0·42 g. HD. WR. −. Inj. hyd. gr. 1 IM.

CASE 6.—Sore ulcerating through prepuce exposing glans penis, and erosive ulcer on skin of penis half way up shaft. History of syphilis 1918. WR. ++. *S. Pall.* detected in sores on day of injection, but not subsequently.
16/2/20: Neosalvarsan 0·45 g. IV. Inj. hyd. gr. 1 IM.
23/2/20: Sulfarsenol 0·24 g. SC. in 10 c.cm. distilled water. No pain. Inj. hyd. gr. 1 IM.
1/3/20: Sulfarsenol 0·48 g. IM. Inj. hyd. gr. 1 I.M.
8/3/20: Inj. hyd. gr. 1 IM.
15/3/20: Sulfarsenol 0·42 g. IM. Inj. hyd. gr. 1 IM.
22/3/20: Sulfarsenol 0·48 g. IM. Inj. hyd. gr. 1 IM.
29/3/20: Rest.
7/4/20: WR. − Neosalvarsan 0·45 g. Total sulfarsenol 1·62 g.
7/4/20: Sulfarsenol 0·42 g. IM. Inj. hyd. gr. 1 IM. Patient transferred to another hospital.

CASE 7.—Admitted with an erythematous rash on chest, shoulders, arms, and abdomen. Well-marked general and inguinal adenitis. Healed sore on prepuce. Mucous patches on tonsils. *S. pall.* found in rash before first injection, not after. The patient was transferred to Rochester Row six days after WR. had been returned positive.
3/5/20: WR. ++.
10/5/20: Sulfarsenol 0·42 g. HD (no Herxheimer in rash or throat). Inj. hyd. gr. 1 IM.
11/5/20: C.S.F − − −. No globulin, no cells.
17/5/20: Sulfarsenol 0·6 g. HD. Inj. hyd. gr. 1 I.M.
24/5/20: Sulfarsenol 0·6 g. HD. Rash gone, throat normal. Inj. hyd. gr. 1 IM.
31/5/20: Inj. hyd. gr. 1 IM.
7/6/20: Sulfarsenol 0·42 g. HD. Inj. hyd. gr. 1 IM.
10/6/20: WR −. Total 2·04 g. sulfarsenol.

The above experiments have been carried out under the direction of Major Charles F. White, R.A.M.C., Officer Commanding the Military Hospital, Rochester Row, who has kindly given his permission for the publication of these results. I hope shortly to be able to give a report on a larger number of cases, but thought that in the meantime others might wish to try the above very simple technique of the hypodermic administrations of sulfarsenol in concentrated solution. The sulfarsenol was supplied by Messrs. Wilcox, Jozeau, and Co., of Haymarket, London.

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PLEURAL OBLITERATION:
A COMPLICATION OF ARTIFICIAL PNEUMOTHORAX.

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IN an address to the Yorkshire Tuberculosis Society recently upon lung collapse therapy, illustrated by radiograph, consideration was given to that unfortunate termination of artificial pneumothorax in which, after an effusion into it, the pleural cavity contracts to obliteration. References to this complication are few. In general, the teaching used to be that pleural effusion could aid in lung compression; but one sees signs now of growth of a more unfavourable opinion, and there are the following definite warnings. Teçon and Sillig[1] say that one result of effusion can be its undergoing rapid fibrous transformation, whereby the two pleural layers are united and continuance of artificial pneumothorax made impossible. Murard,[2] writing in 1914 on five years' experience and 98 cases, says that effusion can be absorbed, but often there persist new-formed adhesions which end by obliterating the pleural cavity. Riviere[3] gives a good description, except possibly for considering it only an occasional outcome of pleurisy. He mentions gradual obliteration of the pneumothorax cavity by the contraction of new fibrous tissue in the organised pleural layers, which can be kept apart by no gas pressure, with the common result of a drawing out and partial re-expansion of the collapsed lung, leading to fresh lighting up of the disease. I give an illustrative case.

E. T., barber, aged 17. Turban-Gerhardt Stadium III. left lung Weight, 8 st. 2 lb.; pulse, 105; respirations, 22; sputum, 2 oz. to 4 oz. daily; temperature touching 102° almost daily for months past. Left pneumothorax induced June, 1915. A mean pleural pressure (calculated by means of Kjer-Petersen's screw) of a little over atmospheric, plus ½ cm. H_2O, at most + 3, was maintained. On the succeeding three-weekly chart the temperature never reached 101°, and the sputum had dropped to ʒii.; in another month it was normal, and the sputum ʒss. or nil. In August the temperature rose from normal level to 101°, falling after three days. Small left pleural effusion, on needling serous. At the succeeding refill 390 c.cm. of N changed a mean pressure of − 11 (beginning of operation) to one of + 3½ (end of operation), whereas formerly it took 520 c.cm. or so to make − 9 into + 3. This evident diminution of the pleural space only disappeared temporarily thereafter, when higher mean pressures were resorted to, plus 7 or plus 10. In September the patient began to get up—weight then 9 st. 7 lb.—and take exercise. Condition excellent in all respects until Oct. 16th, when slight vomiting, rise of temperature, and loss of weight betokened another small effusion. With five days in bed apyrexia was regained. On Oct. 23rd exploratory puncture showed plus pressures, although no refill had been given for a fortnight, when the mean pressure had been left at − 2½. The heart was behind the sternum instead of, as formerly, to the right of it. Clearly the whole left pleural cavity was contracting, the pressure readings at subsequent refills confirming this. In November and in December 5 oz. of serous fluid were withdrawn and replaced with N; similarly the next two months. By February, 1916, the apex beat was in its normal position, and a week later moist sounds were audible again over the left upper lobe. Only then did the temperature rise, touching 101° daily and never thereafter falling. Meanwhile higher pressures had been used to antagonise the contraction and a "pocket" discovered in the axilla, but all dilating efforts failed; unfavourable symptoms duly reappeared. After some time a surgeon was obtained who was good enough to interest himself in Sauerbruch's extra-pleural thoracoplasty. Operation July, 1916. The patient's death on the table was in all probability due to use of a general anæsthetic. A somewhat similar case in different hands, also skilfully operated on, and also chloroformed, died on the second day after.

A foreign writer has said that post-pneumothorax effusions are commoner on the left side. However

that may be, I think this is probably true of the complication under notice, because all my cases have been left-sided. Moreover, the left pleural cavity is the smaller, and would have its tendency to contraction aided by the tendency of the dislocated heart to swing back to a normal position.

Pathology of the Condition.

The pathology of this condition has been studied by Jacobaeus.[4] In his interesting paper on thoracoscopy he gives the histo-pathology of a pleural adhesion in cross section, describing, in the case of cord-like adhesions at any rate, a strengthening of the adhesion, after an effusion has occurred, from development of fibrous tissue (up to a thickness of 1 cm.) upon its surface ("weiteren Auflagerungen von Bindegewebe"). Holmboe,[5] too, from radiographic investigation, finds that the post-pneumothorax pleural effusion often first appears in the costo-diaphragmatic angle. This is probable enough, for radiologists designate the "costo-phrenic sulcus" as a common site of small effusions and adhesions. Certainly many workers have considered that an effusion often precedes the recognised physical signs. I have occasionally found the first certain evidence of such a phenomenon, the fact that not so much gas will enter without causing unusually high pressure. Holmboe thinks the risk of a small effusion is that the part of the collapsed lung covered by it can expand again, the liquid not exercising the same control as air or gas. On this view adherence of the two layers would begin below at the costo-diaphragmatic angle and progress all over the pleural cavity. A 1 cm. layer of contracting fibrous tissue would have immense force.

Ætiology and Treatment.

The ætiology of this complication is clearly concerned with that of effusions in general, which, failing sepsis, are due primarily to the bacillus of Koch. This latter, by the nature of the case, is unavoidable, and from the prophylactic point of view we are concerned with contributory causes. Resort to high positive pressures used to be incriminated, but plenty of evidence proves that pleural obliteration can ensue in their absence; in none of my cases had high pressures been used before the effusion appeared. Brauns of Hanover extols the thin needle as preventive of effusions. The most generally invoked contributory cause is exposure to cold. Weinstein[6] laid great stress on this. Forlanini had, of course, mentioned it. Cionini,[7] endorsing his view, quotes 12 cases treated in a cold and damp climate, of whom, in a few days, 3 got effusions, while others under better climatic conditions were much more immune. For myself, I entirely believe in the bad effect of cold, and had come to this conclusion before turning up the literature. All my cases of pleural obliteration were being treated in outdoor sleeping shelters (dispensary practice); in a year's sanatorium work I never met with it, nor in dispensary cases treated in a bedroom near an open window. In one instance, a man earning his living, and in his third year of "refills," it followed hard upon a sudden catarrhal attack in very severe winter weather. For this reason I have resolved to do no more pneumothorax work in shelters if any other accommodation is available.

As for treatment, thoracocentesis and replacement of the fluid with gas or air is useless in the long run. Holmgren's method (extolled by Kuthy for dilating small "pockets" of free pleura) of replacing the effusion with sterile salt solution seems worth trying. But the contraction of new-formed fibrous tissue anywhere in the body is obstinate, and to maintain lung collapse extrapleural thoracoplasty will be required, since plugging between the pleura and the chest wall with some elastic non-absorbable solid (*Plombierung*) is clearly too limited a measure. It is a pity thoracoplasty is not a routine operation in this country, as it already is on the Continent. There are many details in connexion with it, and the local anæsthesia necessary is rather complicated, since the needle must reach the intercostal nerves. It would seem essential to success, however.

The operation mentioned needs more attention here. It is essential in initial adherent pleura, where no pneumothorax can be induced; a complication met with as often as every fourth case suitable for lung collapse therapy. With Spengler's modification—operating in two stages, after a preliminary thoracocentesis—it has earned considerable reputation abroad in the treatment of tuberculous pyo-pneumothorax, a complication possible in any artificial pneumothorax where the collapsed lung contains a cavity. Given this attention, and given also precautions against chill, we should be less troubled by this annoying sequela—pleural obliteration.

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VERTIGO:

ITS RELATION TO ERRORS OF REFRACTION

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VERTIGO is a common everyday malady, and any contribution towards its more successful treatment must be welcome. Mr. Sydney Scott's very interesting paper on this subject in THE LANCET, March 6th, 1920, from the aurist's point of view, will prove helpful both to consulting physician and general practitioner. Certain passages also are of great interest from an ophthalmic perspective. He mentions those cases, apparently very numerous, in which both physician and neurologist are baffled in that neither they nor the aurist have been able to discover any definite cause, and asks: "Why is it that we find the cause of the vertigo so difficult to reveal?" The object of this paper is to offer a possible explanation.

The late Dr. Guthrie Rankin once told me in connexion with neurasthenia that nearly all the patients he sent to the oculist were returned with the report that the eyes were normal, or practically so. Now, my experience—not a short one—tells me that it would be rather a rarity to find a case of neurasthenia in which both eyes are normal. May not the same thing happen in vertigo? So many patients have come under my observation in whom this point is borne out that I do not hesitate to suggest this explanation, and will endeavour to substantiate it by a few illustrative cases.

A Case with Varied Diagnoses and Treatment.

The following would appear to be a case in point:—

Patient, male, aged 32, had suffered from severe attacks of vertigo for 15 years, and consulted me in June, 1916. He had seen many specialists, and the vertigo had been variously ascribed to Ménière's disease, neurasthenia, mucous colitis, enlarged heart, &c. He had undergone a great variety of treatment, but although he had seen two ophthalmic surgeons, he was not wearing glasses. I found slight astigmatism in each eye, and advised glasses for constant use, giving the following corrections:—

$$[\text{A. B., aged 32}]\ R\ \frac{+\cdot 75}{+\cdot 5\ \text{ax. } 145^\circ}\ \cdot\ L\ \frac{+\cdot 75}{+\cdot 5\ \text{ax. } 145^\circ}\ \text{Constant.}$$

He reported in 1917 that he was much better in every way, felt equal to going to the front, and had had no attack for five months. He called to see me on March 8th of this year in what I may fairly call robust health. I do not claim to have cured this patient by spectacles, for he divides the credit of recovery between the glasses and the manipulations of an "osteopath," who found "some displacement of the cervical vertebræ which was interfering with the circulation in the brain." Fortunately he continued to wear spectacles.

Conclusive Evidence.

The next case is, perhaps, more conclusive. The patient had suffered from neurasthenia with frequent attacks of giddiness for two years previous to seeing me. He also had had much advice and much treatment; glasses had not been suggested. His sight was good; no obvious trouble had called attention to the eyes. There was, however, slight astigmatism, and,

in spite of his great scepticism and prejudice, glasses were insisted upon for constant use according to the formula—

[C. D., aged 44]

R $\frac{-\cdot 5}{-\cdot 5 \text{ ax. } 70^\circ}$ L $-\cdot 25$ ax. 70° Dist.

R $\frac{+\cdot 5}{-\cdot 5 \text{ ax. } 70^\circ}$ L $\frac{+1}{-\cdot 25 \text{ ax. } 70^\circ}$ Readg.

There are many points of interest in the patient's own report:—

You keep, I know, such careful notes of your cases that you only have to refer to mine (June, 1912) to know that I suffered terribly from giddiness and nausea, from loss of memory, buzzing in the ears, and from incapacity to keep my mind centred on any subject long enough to complete the sentence in which I had begun to speak of it. My political work was at a standstill, and I had doubts as to whether I should ever be fit for any work again.

Since I took to glasses I have had only one giddy attack, in July, 1912. From that time my health has steadily improved until when war broke out I was extremely fit. Since then, August 3rd, I have been working at the War Office from 12 to 15 hours daily, and am still feeling well.

Three weeks ago I began to have a recurrence of the old symptoms—that is, I felt my head growing "muzzy," neuritis returned in my left arm. My digestion, too, was getting out of order, with a threatening of the giddiness and sickness. I then remembered that I had broken one of my glasses and had had it repaired here in London, and wondered if the lens were accurate and if that could be the cause of my trouble. I changed my glasses and felt better.

I then sent my suspect glasses to your optician who supplied them originally, and he states that the lens for the right eye is mounted with the front surface to the back, so that the axis of the cylinder is 110° instead of 70°. I have ceased wearing the suspect glasses one week, and already the symptoms are abating.

There could be no clearer proof that my illness, 1910–12, was due solely to eye-strain, and I am deeply grateful to you and the late Dr. Ozanne, who sent me to you."

The error of the optician sometimes brings home to the patient the real cause of his troubles. It also completely answers those ophthalmic surgeons who are sceptical as to the excellent results obtained by the correction of slight refractive errors, and who have asserted that they have been due to "suggestion." There is a tendency to attribute, in these days, nearly all the cases of neurasthenia or nervous breakdown, either directly or indirectly, to the war. In the instance just related the breakdown occurred in 1910, and after being supplied with suitable glasses the patient bore all the stress and anxiety of a very responsible Government post throughout the war with equanimity, and came to see me last autumn in excellent health. In my humble opinion, in many of these cases the starting point or primary cause is slight refractive error, often overlooked.

A Very Severe Case Successfully Treated.

In my next illustration glasses had been prescribed by an oculist for reading only, but as the patient could read easily without them he seldom used them. When I first saw him in 1903 he had suffered for some years from neurasthenia and vertigo, and was in the depths of despair after a long stay in Switzerland without benefit. Afterwards he told me how very near to suicide he had been. In this instance also the return of the trouble was due to an optician's mistake. My prescription was as follows:—

[E. F., aged 51]

R $-1\cdot 25$ ax. 60° L $\frac{-1}{-\cdot 25 \text{ ax.}}$ Dist.

R $\frac{+2}{-1\cdot 25 \text{ ax. } 60^\circ}$ L $\frac{+1}{-\cdot 25 \text{ ax.}}$ Readg.

His report is here given:—

Nov. 24th, 1919.—"Before I saw you in 1903 I had such bad attacks of giddiness that I was often in danger therefrom. Once in London I reeled off the pavement, and only the quick pulling up of the horses by the driver prevented my falling under them, or rather being knocked down by them, for, somehow, I never went down nor entirely lost consciousness. About that time my local doctor took me to see a physician in town, who advised two or three months in the higher residential mountains of Switzerland. But the giddiness was such that I could not go alone, but had to be accompanied by my daughter, who in any place of danger walked between me and it, in case of an attack.

After your prescription for glasses I began to get better, and after some months lost all tendency in that direction and remained free until August of this year. I then had a return of the giddiness, occasionally two or three attacks in the day. Again, after seeing you and the readjustment of my glasses, that condition has passed."

Capacity of Work Restored.

Slight and infrequent attacks of giddiness are usually put down, probably quite erroneously, to indigestion or a "touch of the liver." The more serious ones of which I am treating may spoil a career or imperil life. Fifteen years of useful work were secured as an alternative to retirement in the case next related. The patient had astigmatism in each eye, apparently overlooked, as he was wearing spherical lenses only. He describes his experiences as follows:—

Feb. 20th, 1920.—"I first consulted you on Sept. 15th, 1904, having been suffering for 10 or 12 years from giddiness, so severe that it was necessary to use a stick in crossing a room. My doctor in Harrogate was inclined to suggest that I should give up my work altogether, but it happily occurred to him that the eyes might have something to do with the trouble, and sent me to you. I had used spectacles for reading for some years, but not for constant use, for although I had tried the prescription of a distinguished specialist (since dead) and he had taken great pains, I had to discard his glasses as useless after a few days' trial.

After I came to you everything was changed. Instead of being an unendurable annoyance, walking, spectacles proved the greatest comfort, so also in regard to reading. With this relief came an extraordinary improvement in the giddiness and a most surprising recovery. I was able to carry on my work, which, as you know, involved the greatest strain on both brain and eyes, and did so with the greatest comfort until last year, at the age of 70, I resigned.

I have never ceased to be grateful to you for the wonderful benefit received at a most critical period of my life, and it has been a pleasure to me to consult you regularly ever since."

Cases Attributed to Variations in Blood Pressure.

Many patients tell me that their giddiness has been ascribed to variations in blood pressure. A patient once said he had been "half killed" by treatment directed towards reducing his blood pressure. A pair of spectacles cured his giddiness in a very short time.

A medical man was once sent to me suffering from neurasthenia, giddiness, and great depression. He feared he had a tumour in the brain. He had recently seen a heart specialist who said the giddiness was due to the condition of his heart, which is described in his letter to me. His vision was quite good, and he had worn no glasses, although he had half a dioptre of astigmatism. I advised glasses for constant use, and

[G. H., aged 47]

R $\frac{+\cdot 5}{+\cdot 5 \text{ ax.}}$ L $\frac{+\cdot 5}{+\cdot 5 \text{ ax.}}$ Dist.

R $\frac{+1\cdot 75}{+\cdot 5 \text{ ax.}}$ L $\frac{+1\cdot 75}{+\cdot 5 \text{ ax.}}$ Readg.

he reported as follows:—

Sept. 11th.—"Since seeing you in June I have had a very busy season, and have got on better than I expected. I am very much better, but cannot say that I am quite myself. Have only had four bad attacks, two on 8th and two on July 9th. These are the only bad ones I have had, but fairly often, on first getting into bed, I had a kind of giddy feeling, not amounting to vertigo. I wear the glasses always, and have got quite used to them."

Again, on Nov. 28th, he writes:—

"Since writing you on Sept. 11th, I am glad to say that I have had only one slight attack of vertigo, and none since. I saw Dr. ——— again last month, and he found my heart still dilated, and thought there might be some atheroma of the aorta. I was X rayed and they found slight dilatation of the aorta, which I am told is not uncommon at my age, 47. I feel quite comfortable in my glasses, and have never ceased to wear them."

A Final Illustrative Case.

These illustrations might be multiplied exceedingly, but one more ought to suffice for my purpose.

Mrs. A., who lived in Belfast, had suffered for many years from severe and frequent attacks of giddiness, and was, in consequence, unable to go out unattended; had frequently to come out of church, and often had to leave the breakfast table for this reason. She had seen physicians in Belfast, in Dublin, and a neurologist in London, and glasses had been prescribed for her from time to time by different ophthalmic surgeons for reading only. Her vision in the left eye came up to the normal standard, but there was a quarter dioptre of astigmatism, which had either been undetected or treated as too slight to need correction. She was now advised to wear glasses both for distance and reading, giving this prescription:—

[Mrs. A., aged 54]

R $\frac{+1\cdot 5}{+\cdot 75 \text{ ax. } 30^\circ}$ L $+\cdot 25$ ax. — Dist.

R $\frac{+4}{+\cdot 75 \text{ ax. } 30^\circ}$ L $\frac{+2\cdot 5}{+\cdot 25 \text{ ax.}}$ — Readg.

She had at last found relief.

One may well ask: "Why was the cause of the patient's vertigo so difficult to reveal?"

Her letter to me, 12 months later, is as follows:—

"You will be pleased to hear that I have had practically no vertigo, have had no prolonged attack since last July, and even the swift, little turns have not troubled me now for some months. I never have to leave the table, and, indeed, may say that I am practically free, as I go on the roads freely and never feel distressed, so if that continues, I shall be the happy woman I am at present.

Influence of Slight Errors of Refraction on Nervous System.

Two systems of dealing with refraction have hitherto prevailed. The first, which has held sway for generations, aimed at satisfying the visual requirements; and slight errors, less than one dioptre, not being necessary for this purpose, could be ignored. With the exception of headaches, functional neuroses were left to the physician. Some 20 years ago another system began in a small way to gradually assert itself. It included the former one in that it went more thoroughly into detail in meeting visual necessities, but also urged the correction of slight errors as a means of combating many functional neuroses. Scepticism on the latter point brought forth much hostile criticism, but many who were opponents in those days have since become ardently enthusiastic in favour of these views.

Attention was specially directed to this subject in a paper I published in THE LANCET in 1905.[1] Dr. G. M. Gould, the great pioneer in America in this subject, has been a most prolific writer upon it. A good illustration of the change which has taken place in the ophthalmic world is the fact that Dr. Gould was invited to read the opening paper on Refraction at the Oxford Ophthalmological Congress in 1917. What a contrast to the reception accorded to the publication of his "Biographic Clinics."

Conclusion.

I trust that Mr. Scott will be able to gather from the foregoing a possible solution of the difficulty implied in his question; that he will not too readily accept, in any case of vertigo, apart from ear trouble, the statement that the eyes are normal. We all make mistakes, and so many patients have been cured by glasses, whose eyes had previously been said to be normal. That the defect is too slight to need correction should be accepted only with the greatest caution.

Doubtless there are many ophthalmic surgeons still unconverted who continue to follow the earlier methods of dealing with refraction cases, and also many who have not yet had sufficient experience and success to ensure getting the best possible results in treating the many functional neuroses of which vertigo is a common one.

At any rate, there is plenty of room with all of us for more skill, more accuracy, more thoroughness, more perseverance, and, may I add, more enthusiasm.

Medical Societies.

OXFORD OPHTHALMOLOGICAL CONGRESS.

THE eleventh annual meeting of the Oxford Ophthalmological Congress was held at Oxford from July 14th to 16th in the department of human anatomy of the museum, kindly lent by Professor Arthur Thomson, whilst members again enjoyed the hospitality of Keble College. The attendance was large, including from overseas Professor Harvey Cushing, Dr. Luther C. Peter (Philadelphia), Professor Van der Hoeve (Leyden), Professor S. Holth (Christiania), and Dr. S. Lewis Ziegler (Philadelphia).

WEDNESDAY, JULY 14TH.

On the first day a discussion on Perimetric Methods was opened by Dr. LUTHER C. PETER, who limited his remarks to the newer methods of perimetry and the type of cases for which they were especially adapted. After pointing out the inefficiency of the ordinary perimeter in recording changes in the central zone the opener proceeded to discuss the various modern instruments specially adapted for this purpose. Dr. Peter then urged a change in the nomenclature from linear measure in millimetres to angle subtended in degrees or minutes, and discussed the size of the test object, especially for colour studies. The size for the central zone should subtend an angle of half a degree and that for the peripheral zone one degree. The special methods required for the study of bilateral central scotomata were (*a*) by making use of muscle sense, and (*b*) by the speaker's method of combining perimeter and campimeter.

A discussion followed, in which the following took part: Professor VAN DER HOEVE, Mr. A. H. SINCLAIR (Edinburgh), Dr. MARX (Leyden), Professor CUSHING, Professor HOLTH, Mr. E. H. E. STACK (Bristol), Lieutenant-Colonel R. H. ELLIOT (London), Dr. A. MAITLAND RAMSAY (Glasgow), Major L. E. J. Lister, I.M.S., Mr. T. HARRISON BUTLER (Leamington Spa), Mr. BURDON COOPER (Bath), Mr. E. E. MADDOX (Bournemouth), Mr. P. G. DOYNE (London).

Dr. MARX showed an ingenious test object for use with his perimeter consisting of a small steel ball moved by an electro magnet applied to the back of the screen, whilst Professor HOLTH exhibited three patterns of a chord pocket perimeter of his own design.

THURSDAY, JULY 15TH.

On the second day the Doyne memorial lecture was delivered by Mr. F. RICHARDSON CROSS (Bristol), who took as his subject the Nerve Paths and Centres Concerned with Sight. After paying a tribute to the founder of the Congress, the late Robert Walter Doyne, the lecturer dealt in a comprehensive manner with visual tracts and centres, comparing certain areas with the homologues in monkeys, birds, reptiles, &c. A number of interesting slides were shown of the field of vision in quadrantic hemanopia and cases of injury of the occipital cortex bearing out the more recent views on the relationship between the peripheral visual fields and the centres in the occipital area.

At the conclusion the lecturer received the Doyne memorial medal for 1920.

Papers were read by Mr. A. S. PERCIVAL (Newcastle-on-Tyne) on Light Sense, with some practical deductions drawn from its consideration; Professor VAN DER HOEVE on Eye Symptoms in Tuberose Sclerosis of the Brain, an extremely interesting and valuable contribution to the present knowledge of the disease; Mr. MAURICE BARTON, an Examination of the Eyes of Pit Ponies, particularly with reference to miners' nystagmus.—Dr. A. HUGH THOMPSON read a paper on Physiological and Glaucoma Cups, in conjunction with one by Dr. RAYNER D. BATTEN, entitled "Premonitory Symptoms of Glaucoma, (1) Deep Tension, (2) Excavation of the Optic Disc."—Dr. ZIEGLER'S paper on the Ocular Menace of Wood Alcohol Poisoning attracted attention, as also did a fascinating contribution by Dr. LOUIS SAMBON entitled, "Ancient Eye Instruments."

Discussion on the papers was unfortunately limited by the length of the programme.

On the afternoon of the second day the Congress adjourned to the Eye Hospital, where short papers were read on operations, new instruments, and ophthalmic apparatus, as follows:—

Lieutenant-Colonel H. HERBERT on the Indications of Glaucoma Operations, four illustrative cases being shown.—Professor HOLTH described a new punch-forceps sclerectomy for glaucoma.—Mr. N. C. RIDLEY showed a patient whose orbit he had successfully restored by a plastic operation and who was consequently able to wear an artificial eye.—Dr. BATTEN demonstrated the hydropthalmoscope on a patient and indicated its value clinically.—Mr. PERCIVAL showed some simple devices for estimating the light-sense. All the contributions were freely discussed.

Museum and Festivities.

In the Scientific Museum, which was open during the Congress, Mr. STACK showed a simple and ingenious motor trephine which should prove of considerable aid in the operation of trephining. Mr. R. J. E. HANSON (London) showed a well-designed ophthalmic bureau and equipment for R.N. oculists serving at either a Royal naval hospital, a depôt, naval base, or fleet at sea, and also drawings and models of improvements in gun-sighting telescopes, theodolites, and microscopes.

[1] THE LANCET, June 10th, 1905. Slight Errors of Refraction and their Influence on the Nervous System.

—Mr. MADDOX showed (1) an artificial epistaxis knife; (2) illuminated forceps; (3) the "V" test for astigmatism.—Mr. RIDLEY showed a new cataract knife.—In a separate room Professor Barr's optophone was demonstrated. In the Commercial Museum instruments, apparatus, lenses, and books were on view during the meeting.

At the close of the proceedings on the first day a general meeting was held, after which members with their friends met at Queen's College for tea, the Rev. S. B. Cronshaw acting as host. The official dinner of the Congress took place on Thursday evening in the hall of Keble College.

SOCIÉTÉ DE THERAPEUTIQUE DE PARIS.

AT a recent meeting of this society Dr. BENSAUDE and Dr. HALLION communicated a paper on the Treatment of Asthmatic Attacks by Adrenalin and Pituitary Extract. They stated that two different views were held as to the pathogenesis of asthma, some writers maintaining that it was due to bronchial spasm, and others to vascular turgescence of the alveoli. The two views, however, were not incompatible with one another, for while adrenalin caused a relaxation of the bronchial spasm pituitary extract in small doses caused a fall of blood pressure and relieved the pulmonary congestion.

In a paper on Gastro-intestinal Disturbances of Psycho-neurotic Origin and their Treatment by Psychical Re-education Dr. P. E. LEVY recorded various cases of gastric or intestinal disorders which had been treated for several years by ordinary methods without effect, but were rapidly cured when the underlying moral or psychical causes were recognised and received appropriate treatment.

In a paper on Intravenous Injection of Iodine Oil, Dr. F. RATHERY and Dr. J. CARTIER stated that after experiments on horses they had given intravenous injections to patients suffering from various diseases, such as chronic rheumatism, syphilitic arteritis and lethargic encephalitis, without any bad effects and with decidedly better results than had been obtained in the same patients by ingestion of potassium iodide. The doses consisted of ½–1 c.cm. of lipiodol, the injections being given every week or fortnight.

In a note on the Treatment of Hæmorrhoids by Cupressus Sempervirens, Dr. H. LECLERC stated that the use of the cypress as a hæmostatic and astringent dated from the time of Hippocrates. The preparations which were to be recommended were the fluid extract, the tincture (20–30 drops twice a day before meals) or the soft extract (0·15–0·20 g. daily). The fluid extract, or 5 per cent. tincture, could be applied externally, and also the soft extract in the form of an ointment or suppositories, each containing 0·15 g. of the active principle. All cases so treated showed an attenuation of their inflammatory symptoms, and cessation or diminution of hæmorrhage, pain, and spasm of the sphincter.

In a paper on the Treatment of Gastric Syphilis Dr. G. LEVEN stated that many medical men were ignorant of gastric syphilis and its effects. Before making the diagnosis of cancer of the stomach the practitioner should always think of syphilis and try the therapeutic test, whatever the Wassermann reaction might be. Dr. Leven's treatment was as follows: first day, intramuscular injection of 0·02 g. of biniodide of mercury; second day, mercurial inunction; third day, mercurial suppository; fourth day, another injection; fifth day, inunction; sixth day, suppository, and so on until the twenty-first day, except that the inunction was given only five times, an injection or suppository being substituted when four inunctions had been given. When the period of 21 days' treatment was completed the patient was given 15–20 days' rest and then a second or third series, if necessary, was ordered. Three grammes of iodide of potassium were given daily simultaneously with the mercurial treatment. Arsenical compounds were not employed.

Reviews and Notices of Books.

THE SHIBBOLETHS OF TUBERCULOSIS.

By MARCUS PATERSON, M.D., Medical Superintendent, Metropolitan Asylums Board, Colindale Hospital; late Medical Superintendent, Brompton Hospital Sanatorium, Frimley; Medical Director, King Edward VII. Welsh National Memorial Association; Resident Medical Officer, Brompton Hospital. London: John Murray. 1920. Pp. 239. 10*s*. 6*d*.

WITH regard to the insane, medical men are ready to admit the superiority of institutional over home treatment, and to concede to the alienist the qualifications of a specialist better equipped than themselves to treat insanity successfully. At present the position with regard to pulmonary tuberculosis is very different. It is a disease every practitioner treats, and the aid of the specialist is seldom invoked till the disease is incurable. One reason for this state of affairs is the belief, still prevalent, that when plenty of fresh air, milk, eggs, butter, and rest or exercise have been prescribed, little further need, or can, be done. Dr. Paterson's book will come as a rude shock to the exponents of this comfortable creed. He gives the Encyclopædia Britannica definition of shibboleth as: "A catch phrase or cry to which the members of a party adhere after any significance or meaning which it may have imparted has disappeared," and, as an example, he quotes H. R. Reynolds: "Christians were ready to insist on that insensate shibboleth: Except ye be circumcised, ye cannot be saved."

To readers whose knowledge of pulmonary tuberculosis is derived from the platitudes of most text-books and the perfunctory teaching of this subject in many general hospitals the author's book will be little short of a revelation. One after another of the stock teachings of an older generation are irreverently pulled down from the safe niches which the passage of time has left high and dry. Some of these relics are dusted, patched up, and replaced, but many are mercilessly consigned to a damnation unrelieved by the faintest praise. It is impossible to follow this process of destruction without becoming infected with some of the author's glee over the bonfire. It is really amazing that so many myths concerning tuberculosis should still exist.

In each of the 59 chapters a shibboleth is dissected. The author begins by exposing the folly of sterilising milk without heeding germ-laden butter and cheese. He also stamps as shibboleths that (1) cod-liver oil is necessary in the treatment of tuberculosis; that (2) exertion causes hæmoptysis; that (3) cold foods and drinks are necessary for the treatment of hæmoptysis; that (4) a tuberculous empyema should be opened and a tuberculous larynx scraped; and that (5) a change of climate is good for tuberculosis. The promoters of farm colony schemes will hardly be flattered to find their progeny superannuated as shibboleths, but they may find comfort in the reflection that the author's alternative scheme—a garden city for tuberculosis—is first-cousin to the farm colony. Of the value of sanatoriums the author has no doubts, and a recent criticism of them by Dr. L. Cobbett is mercilessly ridiculed. Cobbett's statements are interpreted by the author as meaning that "..... in plain language ..... one of the surest ways to stamp out tuberculosis would be to hasten the deaths of all tuberculous persons. There can be no doubt that to kill every person having tuberculosis would be quicker still." The half-truth—"once tuberculous, always tuberculous"—is parodied by the author's rendering: "once a patient has had pulmonary tuberculosis, he is never allowed to suffer from any other disease."

It would be very hard to overrate the value of this book. Yet here and there the author kills shibboleths only to replace them by others; as, for example, when he insists on divorcing treatment of the disease from

training of the patient for a suitable profession, or when he recommends morphine in hæmoptysis. But these are minor details, and the book, as a whole, is as sound in its teaching as it is pungent and entertaining in its style.

DIE DEUTSCHE CHIRURGIE IM WELTKRIEG 1914 BIS 1918.

Herausgegeben von AUGUST BORCHARD, Professor in Berlin-Lichterfelde, und VICTOR SCHMIEDEN, Direktor der kgl. chirurgischen Univ.-Klinik, Frankfurt a.M. Leipzig: Johann Ambrosius Barth. 1920. Two vols. Pp. 938. M. 102.

THROUGHOUT the war it was widely stated and believed that German war surgery was greatly inferior to that practised by French and British surgeons. Sometime we shall know to what extent this was true, but German surgeons were not guilty of all the barbarities attributed to them. Shortage of materials compelled them to resort to the use of inferior substitutes, which handicapped them in their work to an extent it is still difficult to realise in spite of the ocular demonstration provided by the condition of returned prisoners of war. This much it is necessary to remember.

We have now the means of roughly comparing German surgery as a whole with ours by this large and impressive text-book in two volumes, edited by Professors August Borchard of Berlin and Victor Schmieden of Frankfort. It is, of course, difficult to judge after the event how efficiently the work was carried out in the average field hospital, but the impression produced by a perusal of these volumes is that German methods were, on the whole, though with important exceptions, not widely different from ours. They were faced with precisely the same problems, and they seem in most cases to have arrived at the same solutions. No doubt the literature of French and British war surgery was available on the other side of the line, and the German is a past master at extracting the best from other people's ideas. But if German war surgery owes anything to the Allied nations, the debt remains unacknowledged. True, the Carrel-Dakin treatment is described, but we have searched in vain for other reference to French or British authorities.

The whole field of war surgery, including late treatment, is difficult to compress into 900 pages, and the attempt to be exhaustive has resulted in an inequality which is sometimes ludicrous. An example of this is to be found in the page devoted to the condition of "chylothorax" following wounds of the thoracic duct. Another is the tendency to give quite worthless statistics; it can hardly serve any useful purpose to state that, of 309 wounds of the penis, 41 were mortal, without specifying the other wounds that accompanied them. All war statistics are apt to be misleading owing to the presence of incalculable factors. The German claim, however, that in penetrating wounds of the abdomen 40–50 per cent. of the cases operated upon were saved seems a modest one. During the last year of the war the percentage of recoveries in British hospitals was considerably higher than this. An advantage of the exhaustive method is to be found in an interesting chapter on self-inflicted wounds, which we do not remember to have seen separately described in any text-book in English.

In trying to form an independent estimate of German surgical efficiency we turned naturally to three topics of outstanding importance—the treatment of gas gangrene, of shock, and of fracture of the femur. It was rumoured, as widely as the uncomplimentary rumours referred to above, that during the war the Germans had been more successful than ourselves in the search for an efficient serum with which to combat gas gangrene. And we find that, in the present work, emphasis is laid on the use of a polyvalent bactericidal (not antitoxic) serum; it is even recommended that it be given prophylactically at the same time as the antitetanic serum, which was used in the German army, as in ours, for every wounded patient. Here they seem to have been in advance of us; but we should like to know more of the results. In the other two test subjects it is pretty clear that we outstripped the Germans in the race for efficiency. Judging by what the Berlin and Frankfort professors have to say, the causes and treatment of shock do not seem to have been extensively studied or understood. The extremely inadequate account of blood transfusion that is given suggests that this vital method was very little practised; and other substitutes for saline infusions, such as gum solution, are barely mentioned. In the description of the treatment of fracture of the femur no place has been given to the Thomas's splint; we should not expect to find it referred to under that name, but it does not seem to have been used at all. Instead, plaster bandages, with windows cut in them at the site of the wounds, commended themselves to the writer of this chapter, and we receive an impression of rough and ready methods. We cease to wonder at the condition of returned prisoners of war. In the after-treatment of their own wounded, extension seems to have been applied largely by means of nails or some equivalent driven into the bone, and no contrivance, such as Pearson's callipers, resting lightly on the bone, is described or figured. If for the purpose of fixing a fractured femur during transport the Germans had any method as good as that of Thomas, it fails to emerge from the volume before us.

The book is well produced and illustrated. The handsome cloth binding deceives the eye at first, but on looking closely we see that, except for the back and corners, it is made of a cloth substitute.

ANNALS OF MEDICAL HISTORY.

New York: Paul B. Hoeber. September, 1919. Pp. 213–304. $2.50.

THE publication of this part has been delayed by difficulties in printing. The papers are of much interest. One is an appreciation of Bence Jones, another deals with the accounts of Felix Platter, the well-known Basle physician of the sixteenth century. His accounts show that in 54 years he made £120,020, Basle pounds that is, which would amount in modern money to about £25,000, but of course the purchasing value of money in the sixteenth century was far higher than to-day. Besides his purely professional occupations Platter increased his income by the breeding and sale of silkworms, silk, and canaries. Perhaps the most interesting paper in the number is that by Dr. John Foote called "Ancient Poems on Infant Hygiene," dealing with two sixteenth-century poems, the one by Tansillo, called "The Nurse," and the other by Scévole de St. Marthe, called "Pædotrophia." Didactic poems are always good reading, and perhaps no other class of literature shows such wide divergences. Compare the beauty of the "Georgics" and the austere majesty of the "De Rerum Natura" with Dr. Grainger's poem on "The Sugar Cane"; or, to take an even worse poem, with the astonishing drivel of Solyman Brown's "Dentiad." Bad as this latter was though, its advice is sound.

> "Whene'er along the ivory disks are seen
> The rapid traces of the dark gangrene,
> When caries comes, with stealthy steps to throw
> Corrosive ink spots on these banks of snow,
> Brook no delay ye trembling suffering fair,
> But fly for refuge to the Dentist's care.

The poems discussed by Dr. Foote are on a much higher level than Mr. Brown's, and the hygiene of them is excellent; the therapeutics and the physiology are naturally not in accordance with modern ideas.

Great interest was taken in infant hygiene in the sixteenth century in France owing to the lessening of population brought about by the civil wars, while in the eighteenth century in England reform of infant mortality and the treatment of children's diseases were beginning to be considered as desirable. Both Tansillo's poem and that of St. Marthe were translated into English 1797–98—the one by William Roscoe, the other by Dr. H. W. Tytler, though a previous translation of Pædotrophia by N. Rowe had appeared in 1710. Rowe also translated another poem by the Abbé

Quillet called "Callipædia, or an Art How to Have Handsome Children," so that any married couple equipped with these three volumes could not plead ignorance of either pre- or post-natal hygiene. Despite the astonishing folk lore of all three poems, there is a great deal of instruction which is quite unexceptionable and which might well be impressed upon both expectant and actual mothers to-day.

Another interesting paper is that by Dr. Pleadwell, being an account of William Paul Crillon Barton, an ardent reformer in the American Naval Service, who was born in 1786. He seems to have been a genius, but if the portrait of him which is reproduced is a good likeness, we must agree with a contemporary who pronounced his style of dress "equally unnatural and eccentric."

DENTISTRY.

By BAYFORD UNDERWOOD. London: J. and A. Churchill. 1920. With 10 illustrations. Pp. 216. 9*s*. 6*d*.

WITHIN the space of a little over 200 pages Mr. Underwood has contrived to compress the essential facts of dental anatomy and dental surgery. The book should be of value to the student who, having mastered his subject from the standard text-books and his hospital practice, wishes to refresh his memory just before undergoing the ordeal of examination.

EVERYDAY MOUTH HYGIENE.

By JOSEPH HEAD. London: W. B. Saunders Company. 1920. Illustrated. Pp. 63. 5*s*.

THE object of this small book is to enable "loving mothers and conscientious nurses" to acquire a knowledge of the principles of mouth-cleansing. The author starts by describing with the aid of diagrams the morbid conditions usually known by the terms pyorrhœa alveolaris and caries, and impresses on his readers that these conditions can be prevented by the regular removal of the bacteria from the surfaces of the teeth. He considers that in the use of floss silk and the tooth-brush lies the salvation of the race from dental disease.

In a book written for the laity we are disappointed to find no reference to the influence of diet on the dentition, or to the importance of nasal breathing and of active function of the teeth. The prevention of dental disease will not be accomplished by the employment of artificial methods, but by a recognition of the fundamental principles underlying the physiology of mastication. The book is well illustrated, and the methods of cleansing the teeth clearly described.

AIR SICKNESS: ITS NATURE AND TREATMENT.

By R. CRUCHET, Professor of Medicine in the University of Bordeau, and R. MOULINIER, Naval Surgeon. Translated from the French by J. ROSSLYN EARP, M.A., M.R.C.S. London: John Bale, Sons, and Danielsson. 1920. Pp. 96. 5*s*.

IT is a pleasure to be able to welcome this excellent translation of MM. Cruchet and Moulinier's little book. The whole question of the investigation of the physical fitness of pilots, and of the special disabilities that result from flying, is so important, that it is very stimulating to have the views of our French colleagues set before us. The writers emphasise the rise in diastolic pressure that is found after a flight, and attribute it to vascular changes induced by the rapid alterations in the atmospheric pressure, since they have found it greater when the descent has been very rapid. They compare the effect of flights with the changes in blood pressure induced by violent exercise. The results that they report seem to us to be explicable as an after-reaction to the low diastolic pressure which exists during the flight, as they themselves have shown, and which English and American workers have found may be produced by mere exposure to low oxygen tensions, and we do not consider that they have sufficiently disposed of the arguments of their opponents, MM. Marchoux and Nepper, who attribute almost the whole effect of a rapid descent to the pressure differences set up in the ear. When one considers the effects that may be produced on the vascular system by vestibular stimuli, as, for instance, in seasickness it is difficult to exclude this factor. Mere slight fatigue and the reactions which follow emotion are also probably contributing factors and receive some, though in our opinion insufficient, consideration. There is one misprint on p. 89, since it is clear that Valsalva's manœuvre should have been recommended for descents, and Toynbee's for ascents and not vice versa.

This book may be safely recommended to all those who are interested in the medical problems of flying, since the authors develop their arguments well, even when dealing with very controversial points, and include valuable advice on the hygiene of flying men.

GOD'S PRICE.

By MAUDE LEESON. London: George Allen and Unwin, Ltd. 1920. Pp. 314. 7*s*. 6*d*.

HAD Miss Leeson devoted less space and care to propounding her philosophy that "God's debts are not to be settled cash down," she might have written a less tedious and more artistic story of the subsequent meeting and reunion of a divorced couple. She has missed an opportunity of producing a valuable work, for she observes well and lacks many current affectations in literature on the subject of love and marriage.

THE DIARY OF A POLICE SURGEON.

By GRAHAM GRANT. London: C. Arthur Pearson, Ltd. 1920. Pp. 188. 3*s*. 6*d*.

THIS is a selection of the more arresting episodes in an East-End practice extending over some 30 years. We can recommend it to all as an example of canny observation; to the medical student as supplying that touch of reality without which forensic medicine is merely a phantasy of the legal mind obsessed; and to the layman as a dramatic tale of life, after reading which he can no longer wonder at the popularity of the Lyceum productions. In our police surgeon we early suspected his relish of a "really good fight!"

BRIGHTNESS AND DULLNESS IN CHILDREN.

By HERBERT WOODROW, Ph.D. London: J. B. Lippincott and Co. 1919. Pp. 322. 6*s*.

THIS book by the associate professor of psychology in the University of Minnesota suggests that whilst we are more or less at a standstill in England there is a steady and continuous advance in educational research in America, of which the author gives a review. The earlier part of the work is of medical interest, dealing as it does with the graded status of the individual, reckoned from the chronological, mental, anatomical, and pedagogical age, with the relations of these gradings and with their value for assessment as to the future work of the individual child.

The rapid growth of the brain in pre-school age is well illustrated by a diagram, stated to embody the most recent research, but reminiscent of that published by Donaldson 25 years ago. Eruption of the teeth is taken as the best criterion of anatomical age, but unfortunately, although the author is apparently aware that girls have, on the average, one tooth more than have boys of the same age, there is no sex discrimination in the table given. The ossification of wrist bones has also been put forward as a means of determining age, but it is still doubtful whether this can be as universally accepted as the author suggests. However, he builds up a clear and concordant picture showing that anatomical age, however measured, correlates to mental ability, and that, whether the brightness of the child be high or low, the rapidity with which his mental growth is completed correlates with his anatomical age. When the latter is less than the child's chronological age the author advises that attention should be directed primarily to his health. But physical defects are far from being

the chief factor in school retardation. Evidence of mental superiority over the boy is more than accounted for by the girl's superiority in anatomical age. What Roberts showed in THE LANCET[1] 35 years ago for the group of girls above puberty Dr. Woodrow demonstrates for those below that age. The school standard is found to be a little too high for the average, so that the majority fall behind. Girls, however, make more progress than boys. The evidence of early fixation of the child's capacities even before school age is also reviewed. The uselessness of effort to educate the dullest is emphasised, for if a child's intelligence quotient (the mental age divided by the chronological) is below 0·7 arithmetic, except of the very simplest, is out of the question, and if it is below 0·4 instruction in reading is hopeless. Taking children as a whole, 10 per cent. are subnormal and 4 per cent. supernormal, so that something more than ordinary schooling is a necessity in many cases.

The book is mainly taken up with psychological assessments of children, and may be read both as an indictment of our scholastic system and a guide to the way out.

TASCHENBUCH DER AUGENHEILKUNDE FÜR ÄRZTE UND STUDIERENDE.

Fourth edition. By Dr. CURT ADAM. Berlin and Vienna: Urban and Schwarzenberg. 1920. With 72 figures and 5 plates. Pp. 400. M. 66.

THIS book, the first edition of which was published in 1908, is addressed to the German-speaking practitioner, and presumably contains so much of the theory and practice of ophthalmology as he is expected to know, indicating the cases in which the help of the specialist should be called in. External diseases occupy the bulk of the book. The bacteriology of conjunctivitis finds a place, and so does the differential diagnosis of external muscular paralysis. On the other hand, all diseases of the fundus are left severely alone and the ophthalmoscope is not even mentioned. Even refraction is only dealt with by the description of subjective tests. The retinoscope is presumably an instrument for the specialist. No operative procedures are described except the simple ones that usually fall to the lot of the general practitioner. There is, however, a copious list of formulæ for prescriptions and references to various other methods of treatment. In this country a book purporting to be a handbook on diseases of the eye, limited in the way that has been indicated, would hardly be acceptable. The deplorable economic conditions now existing in Central Europe, one result of which is that even such a small book as this is priced at what would seem to be a prohibitive figure, may account for much.

JOURNALS.

Journal of the R.A.M.C.—In this journal for June Dr. Woodcock completes his notes on Malaria in Palestine. Of fresh infections those in the early part of the year are predominantly benign tertian (82 per cent.), with a maximum in July; malignant tertian began to rise very rapidly in September, and in October had its own maximum and was then far more prevalent (86 per cent.) than the benign. In Palestine infections were massive, and malignant tertian parasites were so numerous in the films that this infection could be quickly diagnosed; often several parasites were seen in the first microscopic field. Intravenous injections of 12 gr. of bihydrochloride of quinine in 10 c.cm. normal saline injected slowly through a very sharp fine needle, 1 c.cm. in half a minute, and repeated twice daily for two days, had more effect on the disease, and with less inconvenience to the patient, than any other treatment which he saw there.—Major C. T. H. H. Harold tells how he met, traced out, and stopped an epidemic of tick fever in Persia. It was spread by *Argus persicus*, a bed bug. Men were infected in dirty caravansaries and with relapsing fever, not of the Indian but of a Persian character, resembling the relapsing fever of East Africa. The disease yielded to injections of neo-salvarsan.—Captain J. A. Glover, O.B.E., with a statistical account of some 250 cases of cerebro-spinal fever, shows that while the average death-rate was about 44 per cent., one group of 37 cases, which was lucky in coming under treatment with a new serum, in consequence had only four deaths in all—a 12 per cent. mortality—Lieut.-Col. E. P. Sewell, C.M.G., D.S.O. and others discuss an outbreak of food poisoning in 31st General Hospital at Port Said on Jan. 19th and 20th, 1917, with 473 cases and three deaths. It attacked mainly the patients but also a few of the orderlies. The infected food was probably the tinned milk used in the tapioca pudding and the tea, and it was probably in some way infected after the tins were opened, but the exact causation remains obscure, in spite of the careful investigation that was made.

Journal of Neurology and Psychopathology, Vol. I., No. 1.—Dr. William McDougall, of Oxford, contributes a paper dealing with suggestion and its definition. His amended definition is couched in the following terms: "Suggestion is a process of communication resulting in the acceptance with conviction of the communicated proposition independently of the subject's appreciation of any logically adequate grounds for its acceptance." He explains the assertion of Professor Janet and others that they can hypnotise only neurotic subjects and that the patients, when cured, can no longer be hypnotised and are insuggestible, by pointing out that this experience depends on the degree of self-assertiveness of the patient; if the operator invites the intelligent help of the subject, explaining to him the nature of the process, Dr. McDougall says it will be found that his resentment is not aroused, there is no desire to assert his independence over against his would-be hypnotiser, and that with good and sufficient reason successful coöperation with the physician is always possible. —Dr. Worster-Drought contributes a useful and practical article on the Treatment of Cerebro-spinal Fever, which can be recommended as a thoroughly up-to-date presentation of a subject which has undergone considerable modification as the result of war experiences.—Dr. Parkes Weber sends a paper on Thinking and Dreaming, and the Freudian explanation of dreams, based on interesting evidence culled from what was supposed to "constitute life" amongst ordinary sensual individuals in bygone times. His contention is that the Freudian teaching that nearly all dreams have a sexual explanation is most unlikely to be true, or that the element of truth in it is so exaggerated as to appear preposterous.—Dr. George Watson, of Rainhill, records in some detail the pathology of a case of encephalitis lethargica involving mainly the cerebral cortex.—There are shorter papers by Dr. Douglas Firth on Cerebellar Fits of the Hughlings Jackson type, by Dr. R. M. Stewart on Hypotonia in General Paralysis, and by Dr. Graham Brown on the Phenomenon of Heteræsthesia in a case of Spinal Concussion.—A particularly useful critical review on Vagotonia, by Dr. Alfred Carver, is also worthy of mention.

LONDON HOSPITAL MEDICAL COLLEGE.—On Monday, July 5th, the prizes and certificates were distributed to the successful candidates of the Medical College of the London Hospital for the session 1919–20. The distribution was made by Dr. Robert Hutchinson, a physician to the hospital and member of the College Board. The following is the list of the scholarships and prizes awarded: "Price" entrance scholarship in Science, £100, Mr. L. Mushin; Second entrance scholarship in Science, £50, Mr. H. Taylor; "Price" university scholarship in Anatomy and Physiology, £52 10*s*., Miss C. M. Otley, of the University of Oxford. Medical prize, £20, Mr. D. Hunter; prize in Clinical Obstetrics and Gynæcology, £20, Mr. M. C. Hartley; honorary certificates, Mr. J. R. Zeitlin and Miss M. E. Kennedy. "Andrew Clark" prize in Clinical Medicine and Pathology, £26, Mr. D. Hunter; honorary certificates, Mr. P. Steinberg and Mr. F. H. W. Tozer. Surgical prize, £20, Mr. D. Hunter; honorary certificates, Miss M. E. Kennedy. "Anderson" prizes in Elementary Clinical Medicine, £3 each: (1) Miss D. J. Fox; (2) Miss D. Gibson; (3) Mr. F. H. Mather; honorary certificates, Mr. H. D. Lawson, Miss H. R. Ashton, Miss D. S. Russell, and Miss E. M. Dixon. Inpatientdresser's prizes, £5 each: (1) Mr. C. S. Cloake; (2) Miss D. Gibson and Mr. W. Thomas, equal, prize divided; (3) Miss H. R. Ashton; (4) Miss G. H. Jones; honorary certificates, Miss G. Denham and Miss D. S. Russell; Practical Anatomy, £6 prize, Miss S. H. G. Robinson; £2 prize, Mr. P. H. O'Donovan; £2 prize, Mr. A. J. Reed; honorary certificates, Mr. D. R. Blunn, Mr. G. N. Golden, Mr. S. A. Grant, Mr. K. W. Todd. "Letheby" prizes, £15 (Organic Chemistry), Mr. R. T. Brain; honorary certificates, Mr. L. Mushin; £10, Chemical Pathology, Mr. C. S. Cloake; honorary certificate, Mr. F. C. Hunt. "Sutton" prize, Pathology, £20, Mr. M. Tree. "Buxton" prize in Anatomy and Physiology, £31 10*s*., Mr. G. N. Golden; honorary certificate, Miss D. Peake. "Arnold Thompson" prize in Diseases of Children, £15, Miss O. G. Potter; honorary certificates, Miss D. J. Fox, Miss M. E. Kennedy.

[1] The Physical Maturity of Women, THE LANCET, July 25th, 1885, p. 149.

THE ROYAL SANITARY INSTITUTE:

BIRMINGHAM CONGRESS, JULY 19TH–24TH.

THE thirty-first annual Congress of the Royal Sanitary Institute was held in Birmingham from Monday, July 19th, to Saturday, 24th, Lord ASTOR presiding. 12,000 members and delegates attended, this number having only once been exceeded—namely, at Glasgow in 1904.

PRESIDENT'S ADDRESS.

Viscount ASTOR delivered his presidential address at the inaugural meeting on Monday. He gave a broad survey of the relation of government to public health, and declared that under present circumstances local government—i.e., administration and government by elected representatives—was at stake. He was optimistic of the future, but warned the public that the only alternative was the growth of a bureaucracy. The place of those who wished to serve the community was on the councils, and they must not be content to act merely as members of voluntary associations. He made a strong appeal for the best men and women to come forward to serve in this capacity. He emphasised the importance of moulding public opinion; governments could not legislate far in front of public opinion. The various functions and problems of the Ministry of Health were touched upon. Housing at the moment was, he said, the primary concern; a high ideal had been set up, and there was a vast field of work to be explored. He was hopeful of the sequel to the free entry of women into new fields of endeavour.

It is interesting to recall that at the Birmingham Congress in 1898 Sir Joseph Fayrer advocated the institution of a Ministry of Health, and that upon its next visit the Congress finds this former ideal an accomplished fact.

During the week five sections met regularly, being devoted to: (*a*) Sanitary Science and Preventive Medicine; (*b*) Engineering and Architecture; (*c*) Hygiene of Maternity and Child Welfare; (*d*) Personal and Domestic Hygiene; (*e*) Industrial Hygiene.

THE SECTIONS.

In the *Section of Preventive Medicine* Sir ROBERT FIRTH, on Tuesday, in his presidential address attempted to strike a balance-sheet of the national health. On the one side the expectation of life has, he said, increased in males from 41 to 51 years and in females from 44 to 55; the infant mortality rate is well below 10 per cent.; we suffer a relatively light burden from some epidemic diseases and many gross forms of disease have practically disappeared; while whole groups of tropical diseases are coming under control. On the other side, there is a steadily falling birth-rate, an unnecessary loss of life in infancy and before birth, nearly 100,000 new cases of tuberculosis annually, a similar number of cases of diphtheria and scarlet fever, and upwards of a million cases of measles. Further, one-sixth of the children of school age are too dull mentally to derive reasonable benefit from schooling; half are in need of dental treatment. More than half the people under the Insurance Act claim and receive treatment representing an aggregate loss of working time equal to thousands of years per annum. The Garden City he regarded as the product of a confusion of ideas and as giving us doll's house plots and a series of pocket squares of mown grass. He thought our towns should contract in place of expanding and rise instead of spreading. He advocated a closer coöperation between the whole-time public health officers and the general practitioner. The administration of the Public Health Acts had not only failed to attract the sympathetic coöperation of the practitioner, but sometimes tended to divorce his interest from the work.

Dr. G. A. AUDEN discussed the provision of institutions for the mentally defective and enunciated the main principles essential for their success.—Dr. W. A. POTTS, who is psychological expert to the Birmingham magistrates, urged the importance of psychic clinics.

A discussion on the Falling Birth-rate: Is it to be Deplored? was opened by Dr. KILLICK MILLARD. The birth-rate reached its maximum of 36 per 1000 in 1876, since when it has continuously declined, until in 1914 it was 22·8, a reduction of 37 per cent. Dr. Millard considered the question in relation to food-supply, over-population, and fuel-supply, and decided that a reduction in the birth-rate was a wise, civilised, and economical method of meeting the situation.—Dr. P. BOOBBYER (Nottingham) and Dr. S. G. MOORE (Huddersfield) took the opposite view, the latter foreseeing that if we restricted and other nations did not we should be simply overwhelmed.—There was an animated discussion, revealing a sharp division of opinion.

On Wednesday Colonel R. J. BLACKHAM, A.M.S., read an important paper advocating the claims of dried milk. He described the effects of drying upon the milk and pointed out that it still contained vitamines. Being sterile, it is especially useful for infants, notably in the tropics. It also had a great field of usefulness in various disease conditions.—The claims made were strongly supported by several medical officers of health who had used it in infant welfare centres, only one speaker preferring ordinary cow's milk for this purpose. —Professor H. R. KENWOOD advocated the control of the sale of disinfectants, and a resolution was passed demanding that liquids sold as disinfectants should be graded, the lowest having a carbolic coefficient of at least one.—Dr. J. A. DELMEGE read a paper on Malaria Prevention, based on experience with the army in Salonika.

There was a discussion on Public Health Considerations relating to Influenza, Pneumonia, and Allied Epidemics, opened by Dr. F. G. CROOKSHANK, who urged the importance of clear thinking as to the causes of epidemics and the pursuit of historical and epidemiological methods of inquiry. A pandemic of influenza was a coördinated series of happenings, in which individuals and particular sets of circumstances play their part, but ultimately caused by forces, telluric or cosmic, involving periodic variation in the condition of all forms of life.—Dr. W. H. WYNN followed with statistics of the results of the use of vaccines for prophylaxis and treatment. He urged the importance of immediate treatment, and that pneumonia and influenzal broncho-pneumonia should be regarded as emergencies comparable to acute appendicitis or perforated ulcer, demanding immediate action. Of cases of influenzal broncho-pneumonia injected within 24 hours of the onset there were no deaths, and 71 per cent. had a normal temperature within 24 hours of the injection; whereas of those injected on the fourth and fifth day only 30 to 35 per cent. had a normal temperature in 24 hours after an injection.—The papers were discussed by Dr. A. T. NANKIVELL, Dr. J. B. FERGUSON, and others.

In the *Section of Hygiene of Maternity and Child Welfare* the Stillbirth Problem was discussed from the public health point of view by Dr. JOHNSTONE JERVIS (Leeds), and Mr. BECKWITH WHITEHOUSE (Birmingham) spoke on the causes and methods of prevention. Of constitutional causes, venereal diseases and alcoholism were the most potent, and of obstetrical causes, placenta prævia, obstructed labour, and eclampsia occupied the chief place. He advocated Cæsarean section for placenta prævia in substitution for version.

Infant Welfare Work, the Milk-supply, Sex Hygiene, the After-Care of Consumptives, Domestic Animals as a Factor in the Spread of Disease, and the Methods of Rat Suppression were among the prominent subjects discussed at other sections.

On Tuesday evening Sir FREDERICK MOTT gave an address to the Congress on Body and Mind, in which he discussed the nature of functional nerve conditions and their treatment; on Thursday evening Dr. ANDREW BALFOUR delivered the popular lecture on Links with the Tropics, mainly dealing with malaria.

Conferences of Representatives of Sanitary Authorities, Medical Officers of Health, Engineers and Surveyors to County and Sanitary Authorities, Veterinary Inspectors, Sanitary Inspectors, Health Visitors, and Rat Officers also took place. During the whole week an exhibition of apparatus and appliances relating to health and of domestic use, opened on Monday by the Lord Mayor, was held in the Bingley Hall.

We reserve for more detailed notice three papers of particular medical interest read in the sections.

(*To be continued.*)

THE LANCET.

LONDON: SATURDAY, JULY 31, 1920.

The Accuracy of the Medical Register.

IT cannot be too often said, or too strongly insisted upon, that the accuracy of the Medical Register is a professional necessity. The Registrar of the General Medical Council has pointed out this in our columns and in those of the *British Medical Journal* on many occasions, and we have insisted as frequently to our readers that the remedy for omissions or errors in the Register lies in their own hands. The statutory duty of the General Registrar or of the Branch Registrars ceases when an inquiry has been sent to the last registered address of the practitioner whose existing whereabouts it is decided to ascertain, and if no answer is received to such inquiry the name may be legally removed from the Register. This is done reluctantly in a certain proportion of cases, and may result in serious inconvenience to the practitioners concerned. As a matter of fact, this summary, and, be it remembered, legal course, has never been taken without provocation, and the officers of the General Medical Council employ every means, as far as time and circumstances permit, to get into communication with practitioners whose addresses have been found to be incorrect in the Register. An example, alike of the work of supererogation done by the Registrars and of the carelessness of practitioners in the matter, was furnished by what happened at the election of Direct Representatives last November. On this occasion a very large number of voting papers was returned to the Council through the Dead Letter Office. Two-thirds of these practitioners have since been traced, and their correct description will be found in the forthcoming Register, but there is still a number whose addresses cannot be ascertained, and this residual third bulks into the lengthy list which has been furnished to us by the General Registrar, and which is published on pages 259 to 263 of this issue of THE LANCET.

We are asked to request earnestly that any medical practitioners who find their names in this list will immediately communicate with the particular officer concerned in putting the matter right—namely, the Registrar of the Branch at which they were originally registered—while information from friends of deceased persons or others will be welcomed by the same officers. In publishing this list to obtain information the General Medical Council is taking a measure which cannot often be repeated, and we trust that its efforts will be rendered successful by the prompt coöperation of our readers. The reason why so many voting papers at the recent election for Direct Representatives did not reach their destination—in other words, the reason why the existing Medical Register shows a serious percentage of inaccuracy—requires no explanation. Hundreds, nay thousands, of practitioners left their homes at short notice during the war, and as those who read the constant series of obituary notices published in this journal know only too well, a sinister proportion of them never returned. And of those who returned many have not taken up the professional careers which they had quitted, but have changed their addresses, and in some instances their branches of practice. It was only to be expected, therefore, that at the close of the war the Medical Register should require drastic overhauling and heavy correction, and to enable these things to be done the Council is making a special appeal for the help to which the officers have a right; while if this help is withheld the consequences will recoil upon the practitioners of medicine directly, while public business may be impeded.

The following points should be remembered. It is by no means unusual for doctors to practise under names which differ in some particular from those appearing on the Register in accordance with the original enrolment. Sometimes Christian names or initials are dropped or added, sometimes hyphenated names are used. It is now the custom for the Ministry of Health and other public officials to consult the Register regularly, and to decline to recognise anyone by a name which is not that registered. Therefore those who have made an alteration in name should take the necessary steps to have the matter put in order by causing a corresponding alteration to be made in the books of all the bodies whose qualifications they hold, and by notifying the fact to the Registrar concerned. The General Medical Council charges a nominal fee of 6*s*. for making the change, which involves some expense to it, and the fee includes the Government stamp for 1*s*. for a certified extract from the Register as corrected.

Cancer Research To-day.

THE discussion on cancer at the recent meeting of the British Medical Association and the annual report of the Imperial Cancer Relief Fund give an idea in what directions, after a break of five years, the attack on this problem is going to be resumed and how far it had progressed when it was interrupted by the war. A modern feature of experimental cancer research is the absence of speculation on the nature of cancer. The speculations, which were formerly a favourite pastime of the morbid anatomist, appear to have little attraction for the experimental worker in cancer. He is a sober-minded person who is out for facts which can be ascertained and established experimentally, and he has little use for speculations, brilliant though they may be, which in the present state of our knowledge must necessarily be based on insufficient grounds. A striking result of such research has been to reveal the inadequate nature of the purely morphological criteria on which hitherto the definition of malignancy has rested. Thus the fowl tumours discovered by ROUS, and transmissible by a virus, are morphologically indistinguishable from sarcomata which cannot thus be transmitted. Again, by continued irritation of susceptible cells it is possible to produce a lesion which microscopically is indistinguishable from a typical epithelioma. Nevertheless, when the irritation is discontinued the lesion may regress and heal. There are, further, certain types of tumours occurring in mice which do not grow when transplanted

back into the animal in which they originated (autoplastic transplantation), while other types of tumours always grow under these conditions. It is evident, therefore, that the term cancer, as used hitherto, has comprised types of cell proliferation which are biologically different, though morphologically similar. These different types must now be separated and distinguished by new criteria. Dr. J. A. MURRAY points out, in the annual report of the Imperial Cancer Research Fund, that auto-transplantation may prove to be an experimental test of malignancy which will render possible a differentiation of the various biological types of neoplastic cell proliferation. This trend of modern cancer research has been clearly recognised by EWING, who writes as follows in the historical introduction to his excellent book on neoplastic diseases. "The twentieth century opens as the experimental era with a systematic study of tumours throughout the animal kingdom, and it seems likely to become noteworthy as a period of specific etiological investigation which promises to widely separate many neoplastic diseases formerly held to be closely related. It may thereby prove to be the era of successful therapeutics and prophylaxis."

Biochemical investigation reveals the same difficulty in finding a property characteristic of malignancy. Not long ago many believed that cancer cells secreted toxins or ferments which destroyed the surrounding normal tissues of the host and thus enabled the cancer cells to prey on their host, who slowly became cachectic. We know now that the production of such substances is not a fundamental property of cancer cells. Their occurrence is due merely to accidental factors, such as necrosis or infection of the badly vascularised tumour. Investigations on the metabolism of cancer cells, their nutritive requirements, their chemical composition, their respiration, have so far failed to reveal any features in which the malignant cell is essentially different from a normal or a non-malignant cell. Cancer cells do not grow by preying on the surrounding tissues, and so far nothing has been found to show that the mechanism of their growth is in any way different from that of a normal cell. The results of homo-transplantation and auto-transplantation, the possibility of inducing resistance against the implantation of a cancer cell derived from a different animal, the failure to do so when the cancer cell is re-implanted into the animal in which it originated, and the biochemical investigations just referred to, all emphasise the fact that there is an essential similarity between the cancer cell and the normal cell. In many respects the likeness between the cancer cell and the normal cell of the animal in which it originated is greater than that between the normal cells of two different animals. The change which takes place when a normal cell becomes malignant is evidently a subtle one, and cannot be expressed in the comparatively crude terms of ferments, toxins, differences in amino-acids, increased affinities for foodstuffs, and so on. The nature of this subtle change cannot yet be stated; and the disability arises from the fact that our knowledge of the physiology of the normal cell life is as yet imperfect, while the phenomena of growth in the normal cell forms almost a terra incognita. What are the changes taking place in the cells of the skin when an abrasion induces their proliferation? And by what mechanism is their proliferation slowed and finally arrested when the normal structure of the skin has been reproduced? These questions cannot yet be answered. But they will have to be answered before we can hope to understand how the malignant cells begin to proliferate and how they escape the control which keeps in check the proliferation of the normal cell. The cancer problem, viewed from this aspect, is a biological problem. The transplantable animal tumours exhibit the phenomenon of growth in a particularly pure and striking manner and their study has already thrown light on the problem of the growth of the normal cell. They also exhibit the phenomenon of senescence. It is here, perhaps, that cancer, which has so far defied all therapeutic attacks, is vulnerable. There are well-authenticated cases where in the human subject new growths of an undoubtedly malignant nature have undergone spontaneous absorption. This process occurs more frequently in transplanted tumours, and it has been found that it takes place during this period of senescence.

The first step in therapy is therefore indicated unless some default in the arguments can be found. It is, namely, to study the factors which determine the onset of senescence and to induce the condition experimentally. A beginning in this direction has already been made; the condition of senescence is associated with a diminished water content of the cells, and appears to be due to a diminished degree of imbibition of the protoplasmic colloids. Such a condition can be induced in vitro by treating the isolated cancer cells with a solution of calcium salts. But attempts to influence in this manner the tumour cells when growing in the animal have so far failed. Here a new difficulty is met with which may for long prove to be a stumbling block to therapeutic attempts. The tumours are generally badly vascularised and extensively necrosed. When substances intended to act on the tumour cells are injected into the host, the sluggish and imperfect circulation prevents them from being carried into the tumour in sufficient concentration before the host has dealt with them by excretion or otherwise. Thus even our first step must be a halting one, while cancer still guards its mystery. There was a time when it was confidently believed that we were almost in sight of the longed for solution, and that one lucky observation might remove the veil that hides it and make us the master of the disease. But we are no longer likely to under-estimate the difficulties which lie ahead while we accept the view that those difficulties are coincident with the most intricate problems of cell life.

From the Cradle to the Grave.

IT has been the dream of the hygienist, the statistician, and the eugenic reformer to possess a complete record of the health of each member of the community from the day of the birth until the final demission, whether from old age, accident, or preventable disease. For a long time past the health record of the school child has been precisely recorded, and in some districts, at least, is continuous with the data obtained from infant welfare and maternity centres. An opportunity for accumulating such information upwards seemed to be afforded by the medical benefit regulations under the National Insurance Act of 1911, which required the panel practitioner to keep records of

the diseases of patients and of his treatment of them. But the form of record then drawn up with the help of the British Medical Association soon proved unsatisfactory, the cards containing particulars of illness being sent year by year to the Insurance Commissioners, who found it impossible to bring together the particulars of illness in regard to a particular patient for successive years, although they had deprived the practitioner of the chance of doing so without undue clerical labour. The system, indeed, seemed to the busy clinician to afford the maximum amount of annoyance with the minimum return of value to himself or anyone else, and it was with a sense of intense relief all round that the duty of keeping any record at all was remitted under the pressure of war. When this pressure relaxed the obligation was not immediately reimposed, for the reason that it was thought better to take the opportunity of devising something more proper to its purpose than the old record had proved to be.

In the spring of this year it will be remembered that a committee was appointed jointly by the Minister of Health and the President of the Scottish Board of Health to consider and advise them as to the new form of this health record. The personnel of this committee, including as it did distinguished representatives of all affected departments of State and medicine, under the chairmanship of Sir HUMPHRY ROLLESTON with two medical members of the Ministry of Health as secretaries, was a sufficient guarantee for the thoroughness of the inquiry, and their report now issued as a white paper[1] considers, in a way in which they have never been considered before, the rival claims arising out of the desire for statistical information and of the ability of the hard-worked practitioner to supply this information. The committee has agreed that the form of record must now be framed so as to afford a continuous story of the insured person's illnesses, and that it shall remain in the hands of the insurance practitioner who is responsible for the insured person's care. Granted these obviously reasonable conditions, it remains to be seen what kind of records it is fair to demand of the doctor. He will no longer have in any case the useless trouble of copying details from card to card at the end of the year; his time will also be further saved by the entry on the patient's card in the first instance of certain particulars by the Insurance Committee. Retaining the card himself, it will be possible for him to use it as his own index register of insured persons. The committee would now impose on the practitioner nothing more than the obligation of making such a clinical record as will be of value to himself and to any other practitioner attending the patient later. Some valuable paragraphs in the report deal with the question of provisional diagnosis, which is the special point too of an appendix drawn up by Sir JAMES MACKENZIE and the staff of the St. Andrews Institute for Clinical Research. Stress is here laid once more on the defects of medical knowledge in the early stages of disease, and the danger of recording as a diagnosis conclusions concerning the nature and causes of illnesses which cannot be regarded as scientifically ascertained. In the new record card, recommended by the committee, separate columns are provided for symptoms, treatment, and provisional diagnosis on the one hand, and on the other for diagnoses of which the practitioner feels reasonably certain.

[1] Cmd. 836. H.M. Stationery Office. Price 3*d*.

Having thus determined on broad lines the scope and extent of the clinical records, the report proceeds to discuss the administrative and statistical uses which can be made of them. The mere maintenance by the practitioner of a continuous record of medical histories will in itself make it possible for departmental inquiry into, say, sickness at a particular age or falling upon those engaged in a specified occupation. The difficulty lies in the fact that the records on the accepted plan will not be returned to the central department until the patients have died or gone out of benefit. Three alternative ways, none of them free from objection, are considered for obtaining the necessary general conspectus, and in the choice between these the committee were not unanimous, while recognising that systematic tabulation of selected portions of the records of a large and clearly defined class of persons would be likely to yield results of value. A promising suggestion, which the committee held to be outside its terms of reference, was to use the certificates of incapacity sent in to the Approved Societies as the basis of some useful analysis without involving the collection of clinical material in the hands of practitioners. It is clear the committee has achieved much by free discussion. But whilst signing the report as a whole, Dr. J. BROWNLEE tabled his preference that records of certificated disability should be kept separate from the clinical notes so as to be transmitted to a central department at suitable intervals. This may still be found practicable. The immediate necessity is to obtain the willing and whole-hearted coöperation of the clinician himself, without which the statistical pyramid has no base, and this is assured by the whole tone of the recommendations. It is hoped that the new system of records may come into force on Oct. 1st next.

Patent Medicines.

THE Proprietary Medicines Bill was published this week. In general its provisions confirm the recommendations contained in the report of the Select Committee on Patent Medicines ordered by the House of Commons to be printed August 4th, 1914. This Committee, during the three sessions of Parliament over which its labours extended, held 33 public sittings and examined 42 witnesses, of whom more than 14,000 questions were asked. There was thus an accumulation of evidence gained on all questions of the sale of patent and proprietary medicines and medical preparations and appliances, and of advertisements relating thereto. The situation is summarised as follows. For all practical purposes British law is powerless to prevent any person from procuring any drug, or making any mixture, whether, potent or without any therapeutical activity whatever so long as it does not contain a scheduled poison. Nor can the law prevent any person from advertising such mixture in any decent terms as a cure for any disease or ailment; from recommending it by bogus testimonials and the invented opinions and facsimile signatures of fictitious physicians; or from selling it under any name he chooses, on the payment of a small stamp duty, for any price he can persuade a credulous public to pay. The Bill aims at putting an end to these abuses, and its progress in Parliament will be watched with the greatest interest. We shall have occasion to deal with the provisions more fully in future issues.

Annotations.

"Ne quid nimis."

A STANDARD ARTIFICIAL LEG.

ARTIFICIAL limb-making has proved a more difficult task than was at one time supposed. The delay in obtaining exactly the appropriate arm or leg to replace the one which has been lost in the service of the country has given rise to annoyance on the part of the patient and caused anxiety to his medical adviser, who knows that the sooner the appliance becomes part of his everyday wear the better for the pensioner in mind, body, and estate. It is satisfactory to learn that arrangements to this end are now well forward at the Ministry of Pensions, which has been considering for three years the standardisation of the types of artificial legs, the object being to facilitate repair and replacement. Work on standardisation was carried out last summer by a committee under the chairmanship of Sir Reginald Bacon, and has since been completed by the Minister's advisers, Sir Charles Kenderdine, director of artificial limb supplies; Mr. T. H. Openshaw; Mr. E. Muirhead Little; Mr. R. C. Elmslie; Mr. Michael Longridge, past president of the Institution of Mechanical Engineers; and Mr. A. D. Bailey, technical adviser to the Ministry. The specification of these standard limbs has been approved by the Advisory Council to the Ministry and by Sir Lisle Webb, Director-General of Medical Services. In a few months all artificial legs of wood or leather supplied to pensioners will comply with the new specification. The method adopted has been to standardise the mechanism of the limb and the metal component parts, leaving the actual limb to be fitted to and assembled for the individual pensioner by the limb-maker. The latter point is of great importance, as every limb must necessarily be adapted to the individual needs of the man. The principle of the artificial leg is that from the ankle up to the thigh a universal pattern will be capable of being supplied in quantity, and that for each man, whether he needs a right or a left leg, all that remains is to affix a suitable foot and a suitable bucket. These two latter items, of course, prevent any attempt at standardisation and mass production of whole limbs. The bucket, for instance, must in each case be made to fit accurately, and a modern ankle-joint will be so constructed as to give the amount of play acceptable to the wearer.

Standardisation is not to be allowed to interfere with progress. It is a standardisation of those types of limbs which have been thoroughly and extensively tested, and of which about 35,000 have been issued. Further improvements will be made, and the types will be modified as these are tested and proved. The Ministry have had in hand the problem of providing a lighter artificial leg, made of duralumin or some similar metal instead of wood and leather, and one type of this light limb has now received the approval of the advisers. Light limbs have evident advantages for certain cases. The pattern now approved will, it is hoped, be capable of being made on a large scale by an engineering firm in such a way that only the actual fitting to the man need be carried out by a skilled limb-fitter.

ANGEITIS IN WILD ANIMALS.

Dr. Herbert Fox,[1] Director of the Laboratory of Comparative Pathology of the Philadelphia Zoological Garden, describes the incidence of angeitis, a collective term including productive endarteritis and degenerative arteritis or arterio-sclerosis, in 5464 autopsies on wild animals. Only 86 cases, or 1·5 per cent., were discovered, their distribution being as follows: mammals autopsied, 1806, angeitis, 33 cases, or 1·8 per cent.; birds autopsied, 3571, angeitis, 53 cases, or 1·4 per cent.; all other animals autopsied 87, angeitis, 0. Degenerative arteritis was observed in 31 mammals, the orders Primates, Carnivora, Marsupialia, and Ungulata being represented. The lesions appeared in the form of roughened, rather opaque areas in the intima, with degeneration of the media, but the sharply outlined, heaped-up, ulcerating roughened intima, so characteristic of human arterio-sclerosis and present to a slight extent in the Aves, was missing. The aorta was by far the most frequently affected vessel, the lesions being usually found at the top of the arch and in the thoracic portion. Deformity was never great, and aneurysms were found only four times. Ten of the 31 cases showed frank renal lesions, about equally divided between the degenerative and glomerular types. Fifty-one instances of degenerative arteritis were found among the class Aves, the condition being commonest in birds of prey, parrots, and gallinaceous and aquatic birds. In birds of prey the lesions, while most pronounced in the aorta, were found also in the main branches in the form of heaped-up, irregular, yellowish-grey intimal patches over the degenerated media. In parrots the lesions were common in the smaller vessels and strongly resembled senile arterio-sclerosis, with its medial degeneration and calcification as seen in man. The gallinaceous and aquatic birds showed insular atheroma in sharply defined areas. Chronic renal lesions were found in 17 of the 51 birds, the degenerative type being apparently the most frequent. Productive endarteritis was present in two mammals—a rodent and an elephant—and two birds. In the birds and the rodent the process was associated with chronic intestinal lesions, and in the elephant with chronic pulmonary tuberculosis. In only two of the whole 86 cases was chronic valvulitis noted, the aortic and mitral valve being involved. In conclusion, Dr. Fox states that arterio-sclerosis was very common in the orders showing the greatest number of cases of gastro-enteritis, this being specially true of parrots, aquatic birds, and herbivorous and carnivorous mammals. The animals most affected were those prepared by nature for severe or prolonged effort, such as in flight or fight.

[1] The American Journal of Medical Sciences, June, 1920.

WAR LOSSES OF THE ITALIAN NAVY.

THE Italian Navy, we are told by the well-known Colonel (Surgeon-Captain) C. M. Belli, in the *Annali di Medicina Navale*, lost 3925 officers and men killed by accidents or enemy action during the war. Italy joined us in May, 1915, and in the five years 1915–1919 the average annual strength of her navy was 3146 officers and 85,780 men, of whom 172 officers and 3753 men were drowned or killed, or, per thousand annually, 10·7 officers, 8·7 men. It is noted that the Italian Army also lost a higher proportion of officers than of men. In all, 150 were killed in the air or from the air (bombs, &c.), 362 in action, 980 in explosions or other accidents on board, and 2433 were drowned. As for deaths from disease, the numbers have not yet been made out for officers, but amongst the men there were 2543, being 68 per cent. of the deaths by enemy action or violence. Influenza claimed 1241; it defeated all efforts at prevention. Tuberculosis took another 195. Its incidence increased yearly from 0·1 per 1000 in 1915 to 0·7 per 1000 in 1919. Its chief mortality fell not upon the small craft, destroyers, and so on, which went to sea, and whose complements were specially selected from men of good physique, but on the battleships, which did not go to sea, but were used as depôts. They had ship's companies more numerous than in peace time, and amongst them were many men, formerly invalided, but now called up, who speedily broke down and infected their neighbours before their condition was recognised. Cerebro-spinal fever caused 68 deaths. Malaria, with 64 deaths, showed only a small increase on normal times, though many men were employed ashore in unhealthy localities. This fortunate result is ascribed to prophylactic measures, and especially to "quininisation" (method not stated). Antityphoid inoculation was introduced in February, 1915. Its effect was at once noticeable. Only 46 deaths from typhoid and 9 from paratyphoid are reported in the five years of the war; 27 men died of ictero-hæmorrhagic spirochætosis or

epidemic jaundice. There were only 4 deaths from cholera, though three Italian ships, carrying Austrian prisoners (captured by the Serbs), had 1500 deaths on board during a three days' passage. Each Austrian bore a label stating his various vaccinations and inoculations, and it appears that the Austrians contracted cholera because they had not been vaccinated within 12 months, but the Italians on board all escaped, for they were revaccinated every three months. Amœbic dysentery caused only 6 deaths; they are ascribed to infection brought to Taranto by the English. No deaths from bacillary dysentery occurred. The splendid cleanliness of the Italian detachments sufficiently explains why there were no cases of typhus or relapsing fever among their detachments ashore in Albania. Altogether the record is a good one.

TUMOURS OF THE CAROTID BODY.

OF the carotid body little is known. Its origin, whether from endoderm, mesoderm, or ectoderm, is doubtful. It seems to belong to the chromaffine system and to have a relation to the sympathetic nervous system like that of the medulla of the suprarenal body. Its tumours come under clinical observation, but the number of recorded cases, of which some are doubtful, does not exceed 80. The most common tumour is adenoma. In the Bulletin of the Johns Hopkins Hospital for June Dr. M. R. Reid has reported three cases from Professor Halsted's clinic. The following is an example:—

A man, aged 46 years, was admitted on March 28th, 1913. In February, 1908, he accidentally discovered a small lump about midway between the angle of the jaw and the clavicle. It caused only disfigurement and gradually enlarged "in spite of all sorts of treatment." Pulsation was first observed in 1911, and had become much more pronounced in the last two years. He was told he had an aneurysm, and advised to see Dr. Halsted. On admission this diagnosis was confirmed by the many surgeons who examined him. A large expansile pulsating mass involved the left side of the neck from the lobe of the ear to within 3 cm. of the clavicle and from the middle of the neck anteriorly to the trapezius posteriorly. Its external circumference was 17 cm. The trachea was displaced 1 cm. to the right of the middle line. A thrill was felt along the posterior part of the tumour, which was slightly compressible. Firm pressure below the tumour did not lesson the pulsation in it. There was a scarlatiniform rash over the upper chest and neck. The left wall of the pharynx was dislocated towards the median line, so that the tonsil lay in the median line below the uvula. The entire pharynx pulsated visibly. Dr. Halsted tied the common carotid artery, which occupied an abnormally lateral position and was surrounded by dilated venules. The artery was dilated and very soft. After the operation the tumour did not pulsate, was much softer, and 5 cm. smaller. A faint bruit, however, was audible. On April 10th, 1919, the patient returned because the pulsation had recurred and the tumour had gradually enlarged. A huge swelling involved the left side of the neck from the mastoid process to the middle line and downward nearly to the clavicle. The trachea was displaced 2 cm. to the right. Over the tumour the skin was erythematous, and over the lower part were large tortuous veins, suggesting angioma. Slight heaving pulsation was visible and a thrill was felt. There was a continuous, almost musical, bruit, with systolic accentuation. Firm pressure over the left common carotid did not affect the pulsation of the supposed aneurysm. There was no bulging of the left side of the pharynx and the tonsils were in normal positions. There was complete paralysis of the left vocal cord. Dr. Reid suspected an angiomatous tumour or an arterio-venous fistula. He performed a difficult operation requiring 4 hours and 20 minutes. Huge vessels were encountered everywhere. The carotid artery was not recognised. It was necessary to resect the vagus nerve and internal jugular vein and the eleventh and twelfth nerves, which ran through the tumour, had to be divided. The sterno-mastoid muscle was excised with the tumour. For 36 hours œdema of the epiglottis caused dyspnœa and then convalescence proceeded. The specimen was very vascular, weighed 190 g., was yellowish-brown on section, and proved to be an angioma of the carotid body.

Keen, who was the first American to write at length about tumours of the carotid body, has given the best illustrations and descriptions of their pathology. He speaks of 12 points which may help in diagnosis: (1) the position at the bifurcation of the carotid artery; (2) movability laterally but not vertically; (3) ovoid in shape; (4) smooth and not lobulated; (5) single; (6) transmitted pulsation; (7) bruit and thrill; (8) bulging of the wall of the pharynx; (9) pupils occasionally constricted; (10) slow growth; (11) long duration; and (12) a rather firm elastic consistency. Speaking negatively, he says they are: (1) not tender; (2) not painful; and (3) the deformity is the main complaint. Yet these tumours have seldom been correctly diagnosed before operation. Aneurysm, as in the case narrated above, has often been diagnosed. Nothing is known of the function of the carotid body, nor have any functional disturbances been described in connexion with its hyperplasia. But in the present case the patient's skin was of a yellowish dark colour and in another of Dr. Reid's cases of a light lemon colour. The pigmentation in both cases cleared up after removal of the adenoma. Were the body juices saturated with chromaffine substance? The pigmentation was certainly associated with the hyperplasia of the gland. As to the treatment, the results are not satisfactory. A mortality of 30 per cent. and a morbidity nearly as high should make the surgeon hesitate before operating. Most of the patients have been operated on for cosmetic reasons and would not have submitted had they known that it is usually necessary to divide the carotid artery, jugular vein, vagus, and hypoglossal nerves. Pneumonia, hæmorrhage, cerebral anæmia, are given as causes of death in this order of importance. Keen and other eminent surgeons are opposed to operation when the tumour is large and the important structures mentioned have to be sacrificed. Small tumours which can be freed from them should be removed. The long duration of the growths reported (1 to 40 years) seems to indicate that a carotid adenoma is not prone to become malignant. For malignant tumours necessarily a radical operation is indicated.

ATROPHY DEPENDENT ON AND CONDITIONED BY HYPERTROPHY.

AMONGST gland cells, perhaps the most inexplicable so far as its multifarious uses and complexity yet separability of functions are concerned is the liver cell, an apparently simple histological unit as revealed by the microscope, yet how obscure is its metabolism and its range of influence upon the adjoining cells of a liver lobule. One feature of its potential activities stands out very markedly. Ponfick and others by means of experiments on rabbits showed many years ago that if a quarter or a half or more of the liver be removed the original bulk and the activities of the organ are renewed within a relatively short time. Rous and Larimore, of the Rockefeller Institute, have recently made other observations in the same direction, which materially add to our knowledge of the relation of the portal blood to liver maintenance. They find that occlusion of portal branches to a portion of the rabbits' liver leads to a progressive, and ultimately complete, atrophy of the parenchyma in the region deprived of portal blood and to hypertrophy of the hepatic tissue elsewhere, which receives such excess of blood. Three-fourths of the liver may thus be reduced to a fibrous bag within two months, while the remaining fourth attains the bulk of the entire original organ. The atrophy is simple, unaccompanied by obvious degenerative changes or by the least connective tissue replacement. More important, however, it is conditional in nature, failing to progress when the bile-duct from the proliferating liver tissue is ligated and hypertrophy checked in this way. Similar changes occur in the dog, but more slowly. The bile secreted by the part of the liver far advanced in atrophy is almost colourless and may give but a feeble Pettenkofer reaction, though the glycogen in the atrophic cells is about the same in amount and distribution as in the hypertrophic parenchyma. Here we have local atrophy dependent upon a local hypertrophy of the same organ, a condition which contrasts with that form of local hypertrophy well known to pathologists dependent upon destruction, leading to compensatory hypertrophy.

ALCOHOL IN NORWAY AND SWEDEN.

ACCORDING to the *Economic Review* (July 23rd, 1920) steps are being proposed in Norway to introduce a new control over the importation of alcohol in that country. The following paragraph taken from the above journal is of interest in this connexion :—

Norway's import of alcohol.—A Bill has been submitted to the Storting in connexion with commercial and maritime agreements between Norway and France, Portugal and Spain relating to the import of alcohol. It contains the following clauses: 1. Perpetual prohibition of the import of spirits and intoxicants, except for medicinal, technical, and scientific use. 2. Permission to import light wines. 3. Future agreements shall not prevent the import of light wines and alcohol for medical and scientific use from constituting a monopoly with a view to guaranteeing social and fiscal interests. (*Sjöfartstidente*, June 12th.)

In the same number there is another item of news on this question referring to the production of alcohol from wood in Sweden.

The output in Sweden.—At the beginning of 1920 15 sulphite spirit factories, with a yearly output capacity of 10 mill. kg. of 95 per cent. spirit, were working in Sweden. Another 7 factories with a total capacity of 7 mill. kg. a year will be established during 1920. These 12 mill. kg. or 21 mill. lit. of spirit correspond to the calorific power contained in 9500 t. of benzine. (*J. Econ. Européen*, June 12th.)

It would thus appear that the question of alcohol as a power agent is being seriously handled by the Swedish Government. The countries which possess ample sources of water power promise to get the lead in industrial developments, based, amongst other things, on synthetic issues. The question of the possibilities of utilising our own natural power resources at home and in our vast colonial empire is no doubt receiving the careful attention of our engineers and chemists, whose energies in these matters are called for unless we choose to be left behind in the race.

ARTERIO-SCLEROSIS OF THE EYE.

THE ophthalmoscopic signs which point to high general blood pressure or to arterio-sclerosis are common ground to the ophthalmic surgeon and the physician. Clifford Allbutt, Osler, and others have thrown light on the conditions which cause the increased blood pressure. Ophthalmic surgeons, beginning with Marcus Gunn, have studied the ophthalmoscopic signs of it; in recent years P. C. Bardsley and Foster Moore have amplified his observations. In the *British Journal of Ophthalmology* for July this subject is reviewed by P. H. Adams. Ophthalmic surgeons, as he says, see an enormous number of patients between the ages of 40 and 55 for the purpose of ordering presbyopic glasses, and serious responsibility is theirs if, when the symptoms are suspicious, they are content to order a pair of reading glasses without going further into the case. What, then, are the ophthalmoscopic signs which ought to receive special attention? (1) The width and brightness of the central white reflex from the arteries, a decidedly narrow and bright reflex constituting what is generally known as the silver wire appearance, but which Bardsley prefers to call copper wire—it is indicative of very high tension; (2) the indentation or obliteration of the veins where they are crossed by the arteries, showing hardness and loss of transparency in the latter; and (3) kinking of the veins at the crossings. These are early signs, and may be considerably modified by measures directed to diminishing the blood pressure or eliminating the toxic cause of it. Signs of more confirmed disease are actual irregularities in the course of the retinal vessels—what is called beading is sometimes seen—patches of œdema, hæmorrhages, or patches of exudation. Such signs do not necessarily prove that serious intracranial disease is impending, but they decidedly point that way, even in the absence of albumin in the urine. This is shown by some statistics published by Foster Moore.[1] The eye, it has been well said, is the window of the brain. According to Adams, the older the patient with arterio-sclerotic changes the better the prognosis with regard to life, irrespective of the presence of albumin in the urine to a large extent, whilst the younger the patient the worse the prognosis, and especially so if albumin is present in the urine. With regard to the prognosis qua vision, except when the whole of the retinal circulation is stopped, as in thrombosis of the central vein, this depends chiefly on the extent to which the macular region is affected. In cases—and they are quite common—where gross signs of arterio-sclerosis are present but the macula remains free, excellent vision may remain. It is a remarkable fact that there is no constant relation between an excessive systemic blood pressure and a raised intra-ocular tension. Whatever the underlying causes of glaucoma may be, a general increase in the arterial blood pressure is not an essential part of the disease.

[1] Quarterly Journal of Medicine, January, 1917.

THE FEDERATION OF MEDICAL AND ALLIED SOCIETIES.

THE first annual general meeting of this Federation was held on Tuesday last, when a Report was presented and unanimously adopted, reciting the activities of the Federation during its inaugural year of work. Sir Malcolm Morris, the chairman of the Executive Council of the Federation, who presided, pointed out that for the medical profession to speak with a corporate voice and in sympathy with public aims was a necessity of the times, and every constituent element in such a union must gain in strength from mutual support. From the Report of the Federation and from the words of the chairman of the Executive Council, we learn that it is entirely outside the policy as well as contrary to the desire of the Federation to rival or supersede any of the existing organisations, great and small, which have done so much work along general and special lines for the advancement of medicine. The hope is to increase the efficiency of all such activities by providing a round table at which matters concerning the public health of the nation can be discussed, so that a policy may emerge, founded on high ideals of preventive therapeutics, expressing the mean of professional opinion and reconciling these views with national developments. The object is profoundly important, and the chances of accomplishment will be high if general and professional support is forthcoming promptly.

THE house and library of the Royal Society of Medicine will be closed during the whole of August for repairs and cleaning.

WAR-TIME VOLUNTARY HOSPITALS.—Of the innumerable forms of voluntary and generous service rendered to the nation during the war none was more valuable, and few were more unobtrusive, than the establishment and maintenance of private houses and other buildings as hospitals for the sick and wounded. During the four years of the nation's emergency 3244 such hospitals were open for the treatment of officers and men of the army, their distribution in areas being as follows: Aldershot Command, 40; Eastern Command, 687; Irish Command, 105; London District, 352; Northern Command, 439; Scottish Command, 314; Southern Command, 660; Western Command, 637; Guernsey and Alderney District, 6; Jersey Command, 4. The work of the hospitals having now been practically completed, the Army Council, in name of the nation, have placed on record their thanks to those whose generosity made the work possible, and the Council are also issuing an inscribed scroll which may be hung in each building as a permanent memorial of the patriotic purpose to which it was devoted in 1914–19. The inscription is as follows:—

"During the Great War of 1914–1919 this building was established and maintained as a Hospital for British sick and wounded. The Army Council in the name of the nation thank those who have rendered to it this valuable and patriotic assistance in the hour of its emergency, and they desire also to express their deep appreciation of the wholehearted attention which the staff of this hospital gave to the patients who were under their care. The war has once again called upon the devotion and self-sacrifice of British men and women, and the nation will remember with pride and gratitude their willing and inestimable service."

More than 500 scrolls have already been issued, and the remainder will be despatched promptly.

THE MEDICAL REGISTER.

UNTRACEABLE PRACTITIONERS.

WE are requested by the Registrar of the General Medical Council to give publicity to the following lists of medical practitioners whose present addresses are unknown. We deal more fully with the subject on page 253 of this issue. Anyone who finds his or her name included should communicate immediately with the Registrar of the Branch whose address is given at the head of the particular list in which the name occurs:—

I. (*a*)—PRACTITIONERS REGISTERED ON THE ENGLISH LIST.

Communications in regard to this list should be sent to the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1.

Addinsell, Augustus Whitehorn, M.B. Edin. 1883, 10, Curzon-street, W. 1.
Alexander, Harold George, F.R.C.S. 1914, c/o Grindlay and Co.
Ash, James, L.S.A. 1898, Salcombe, Devon.
Atkinson, John Lancelot, L.S.A. 1886, Stoke Newington-road, N.
Baber, Henry Aitkens, M.R.C.S. 1878, Chipping Sodbury.
Baker, Frederick Relland, M.R.C.S. 1899, Brighton.
Bates, Howard James, M.R.C.S. 1913, Birmingham.
Bawden, John Clemence, L.S.A. 1893, Brixton-road, S.W. 2.
Baylis, Kathleen (Miss), L.M.S.S.A. 1910, Ormskirk, Lancs.
Beale, Thomas Miles, M.R.C.S. 1885, Kew, Surrey.
Beards, Clifford, M.B. 1907 Oxfd., Pewsey, Wilts.
Behan, Jeremiah, L.R.C.S.I. 1885, Lixnaw, co. Kerry.
Beley, George, M.R.C.S. 1899, Sheffield.
Bellew, Thomas Mulholland, M.R.C.S. 1911, Alder Hey Hospital, Liverpool.
Benson, Percy Hugh, M.B. 1873, Aberd., Upper Walmer.
Best, Albert James, L.R.C.S.I. 1912, Belfast.
Bibby, William Ascroft, L.M.S.S.A. 1917, Liverpool.
Biggs, John Maundy, M.R.C.S. 1878, Gosberton.
Birkinshaw, Eileen Elizabeth (Mrs.), L.M.S.S.A. 1911, S. Croydon.
Birks, Alan Herrenden, M.R.C.S. 1912, Belsize Park, N.W.
Black, Kenneth, F.R.C.S. Eng. 1904, Nottingham.
Blackwood, John, L.S.A. 1895, Southsea.
Bloomfield, Herbert Wadmore Gissing, M.R.C.S. 1895, St. Bart.'s Hospital.
Body, Henry Marten, M.R.C.S. 1865, Wimborne.
Bond, Charles Knox, M.R.C.S. 1884, Builth, Wells.
Borrow, Fredk. Chas., M.B. 1901 Lond., Palmer's Green, N.
Braddon, William Leonard, M.R.C.S. 1884, Ealing.
Brandon, Gordon Normanby, M.R.C.S. 1911, Ealing.
Bronstorph, Ernest Ebenezer, L.R.C.S. Ed. 1918, Coburg Court Hotel.
Brown, Jas. Farquharson, L.S.A. 1891, Commercial-road, E.
Buckley, John, L.S.A. 1898, Manchester.
Burton, Charles Frank, *M.C.*, M.R.C.S. 1913, Upper Norwood.
Campain, Joseph Henry, M.R.C.S. 1911, Hull.
Carr, Donald William, M.B. 1893 Camb., c/o C.M.S.
Cassidy, Joseph Lamont, M.D. 1877, Durh., Ramsgate.
Chambers, John Miles, M.R.C.S. 1897, Murtle.
Chambry, Johannes Karel Joseph, M.R.C.S. 1915, Wednesbury.
Charlesworth, George, L.S.A. 1887, Plaistow, E.
Chatterton, Percy, L.S.A. 1866, Stockwell Green, S.W.
Chevreau, Paulin Roger, M.R.C.S. 1914, Redcliffe-square, S.W.
Cieh, Ying-Jue, M.R.C.S. 1915, Chinese Legation.
Clarke, James Fernandez Howard, L.S.A. 1884, Shaftesbury-avenue, W.
Close, Edmund Napier, L.R.C.S.I. 1881, Exeter.
Coates, Henry Honiton, M.R.C.S. 1890, Skerries.
Coathupe, Edwin Wise, M.R.C.S. 1859, Oxford.
Collyer, James Ralph, M.R.C.S. 1884, Playden.
Coxwell, Charles Fillingham, M.D. 1891, Camb., Dulwich.
Cropper, John Hardman, L.R.C.S. Edin. 1883, Bristol.
Crossit, Richard, L.R.C.S. Edin. 1876, Cookstown.
Cuthbertson, John Oswald, M.B. 1901, Oxfd., Droitwich.
Dargan, Patrick Arthur, M.R.C.S. 1916, St. John's Wood.
Davenport, Robert Cecil, M.R.C.S. 1916, Highgate-road, N.W.
Davey, Ernest Llewellyn, M.R.C.S. 1896, Walmer.
Dearden, Harold, M.R.C.S. 1911, Lowndes-street, S.W.
De Kleyn, Geradus Hendricus, L.M.S.S.A. 1916, Hampstead.
Derry, Bartholomew Gidley, M.R.C.S. 1917, Bodmin.
Dos Santos, Manoel Pedro, L.M.S.S.A. 1914, Bayswater, W.
Douty, Robert Joel Cazelet, M.R.C.S. 1912, Eastbourne.
Driscoll, Cornelius Louis, L.M.S.S.A. 1907, Buckingham.
Duka, Albert Theophilus, M.R.C.S. 1892, Bournemouth.
Duncan, Geo. Cuthbertson, L.S.A. 1877, Charing Cross Hotel.
Dvorkovitz, Paul, M.R.C.S. 1914, North Kensington.
Dyson, John Newton, M.R.C.S. 1901, Eastbourne.
Eatock, Eric Richard, M.B. 1911, Manc., Crumpsall, Manchester
Ede, Alfred Gordon, M.B. 1900, Lond., E. Molesey.
Edwards, Arthur Rae, M.R.C.S. 1881, Cirencester.
Ellerton, John, M.D. 1862, St. And., Middlesborough-on-Tees.
Ellis, Robt. Sidney, M.B. 1900 Ed., Aston Cross, Birmingham.
Elrington, Nicolas, M.R.C.S. 1893, Wethersfield.
Embleton, Dennis, M.R.C.S. 1906, Hampstead.
Emlyn, Charles Willmore, M.R.C.S. 1890, Culworth Hall.
Fairchild, George Cranston, M.R.C.S. 1914, Bishop's Stortford.
Fendick, Robt. Geo., M.R.C.S. 1867, Livermead, Torquay.
Fiddian, James Victor, M.R.C.S. 1912, Brentford.
Flaxman, Samuel Christopher Reeve, M.R.C.S. 1909, Peckham.
Forrest, John George Stracey, M.R.C.S. 1876, Winchest
Foster, Edward Cecil, M.R.C.S. 1902, Oxford.
Fuller, Ashbury Joseph Stuart, M.R.C.S. 1908, Aberystwith.
Gasperine, John Jones, M.R.C.S. 1916, Stockton-on-Tees.
Gauntlett, Harry Leon, M.R.C.S. 1909, Bloxham.
Ghose, Sures Chandra, L.M.S.S.A. 1915, Devonport.
Ghosh, Abani Mohan, M.B. 1915 Edin., Brighton.
Gillam, Thomas Henry, L.S.A. 1876, Tenbury.
Gilruth, George Ritchie, L.R.C.S. Edin. 1865, Edinburgh.
Girgis, Melik, L.M.S.S.A. 1918, Hampstead.
Gott, Jeffrey, L.S.A. 1897, Ringwood.
Gunning, Montague Shirley Wyatt, L.R.C.P. Edin. 1888, Hunter's Bar.
Gupta, Panna Lal, M.B. 1915 St. And., c/o Thos. Cook & Son.
Hale, Edmund Thomas, L.S.A. 1870, Chiswick.
Hall, Ethel Margaret Eades, L.M.S.S.A. 1911, Lancaster.
Hampson, Joseph, M.R.C.S. 1878, Atherton, Manchester.
Hanworth, (Mrs.) Honoria Josephine, M.R.C.S. 1915, Russell-square, W.C.
Harding, Geoffrey Duncan, M.B. 1914 Liverpool, Claughton.
Hardy, George Wilfrid, L.R.C.P. 1906, Sutton.
Harrison, Percy Booth, M.R.C.S. 1906, Dalston.
Harvey, Thomas Reginald, M.R.C.S. 1909, Avebury.
Hawkins, Charles Thomas, M.R.C.S. 1908, Garnant.
Heap, Edward Fortrey George Turnbull, M.R.C.S. 1901, St. Asaph.
Hill, Richard Athelstane Parker, M.D. 1913 Camb., Harrow.
Hocken, Herbert Castlemain, L.S.A. 1901, Barnsley.
Hodgkinson, Isaiah, M.D. 1913 Durh., South Shields.
Hodson, Ronald, *M.C.*, M.R.C.S. 1912, Temple, E.C.
Hooper, Alfred, M.D. 1904 Durh., Gaddesby.
Hope, Percy Lake, M.R.C.S. 1899, Hampton Wick.
Houchin, Edwin Augustus, L.S.A. 1902, Cambridge-gardens, W.
Hughes, Sidney, M.R.C.S. 1897, Clapham.
Hulbert, Henry Harper, M.R.C.S. 1889, Queen's-gardens, W.
Hull, Henry Woolcott, M.R.C.S. 1893, Southend-on-Sea.
Ingle, Arnold Clarkson, M.D. Camb. 1892, Harpenden.
Ingle, Laurence Manfield, M.R.C.S. 1914, Harpenden.
Jackson, George Maudsley, M.R.C.S. 1915, Clifton.
Jacobsen, George Oscar, M.R.C.S. 1889, Alford.
James, Walter Evelyn, M.R.C.S. 1890, Derby.
Jay, Frederick Fitzherbert, M.D. St. And. 1883, Constitutional Club, W.C.
Johnston, Lambert Arthur Wellesley, M.R.C.S. 1901, Edgbaston.
Jones, Arthur Reginald, M.R.C.S. 1897, Leigh.
Jones, Edward Shirley, M.R.C.S. 1897, Liverpool.
Jones, Samuel Walter Maslen, M.R.C.S. 1914, Sandown, I.W.
Joynson, Gerald George, M.R.C.S. 1894, Southport.
Judah, Nathanael Joseph, M.B. Edin. 1911, Ash Green.
Kameneff, Vladimir, M.R.C.S. 1916, University College Hosp.
Kebbell, Chas. Fredk. Vivian, M.R.C.S. 1909, West Ealing.
Keys, Robert Atchison, F.R.C.S. Edin. 1874, Wolverhampton.
Khan, Haji Hyderali, L.M.S. Bombay 1914, Guy's Hospital.
Kilgour, Wm. Rob., M.R.C.S. 1906, Cromwell-road, S.W.
Kingsford, Percival, L.S.A. 1869, Queensberry-place, S.W.
Knobel, William Bernard, M.D. Camb. 1905, Belbroughton.
Knowles, Cyril Reginald, *M.C.*, M.B. Leeds 1916, Bridlington.
Knyvett, Hugh Ferrars, L.R.C.P. Edin. 1889, Ridgemount-gardens, W.C.
Langley, John Inman, M.R.C.S. 1898, Coventry.
Lazanas, Elias Panagis, M.R.C.S. 1916, Harley-street, W.
Lea-Wilson, Basil Hugh Campbell, M.R.C.S. 1911, Gainsborough.
Ledger, Lloyd Kirkwood, M.R.C.S. 1917, Hereford.
Lemon, Edward Henry, M.R.C.S. 1889, Bournemouth.
Lomax, Montague, M.R.C.S. 1883, Brighton.
Low, Charles Arthur, L.S.A. 1877, St. Leonard's-on-Sea.
Lowe, Charles Edwin Maximilian, M.B. 1892 Vict. U., Crewe.
Lynes, John, L.S.A. 1884, Kensington, W.
MacDonald, Charles Eric Wells, M.R.C.S. 1908, Ilford.
McGlynn, James, L.R.C.S. Edin. 1898, Castlederg.
McQueen, Robert Martin, M.R.C.S. 1903, Boundary-road, N.W.
Manders, Horace, F.R.C.S. Eng. 1878, Harley-street, W.
Master, Jehangir Ardeshir, L.M.S. 1905 Bombay, Upper Holloway, N.
Matthews, George William, M.R.C.S. 1912, Maxwelltown.
Maugham, William Somerset, M.R.C.S. 1897, Mount-street, W.
Maunsell, Frederick Wyndham, M.R.C.S. 1916, c/o Nat. Mortgage and Agency Co. of N. Zealand.
May, Francis Hollingsworth, L.S.A. 1890, Birmingham.
Menon, Puthiyaveettil Narayana, M.R.C.S. 1917, Royal Eye Hospital, Manchester.
Mercer, William Bracewell, M.B. 1892 Camb., Southbourne.
Meyer, Gustav, L.M.S.S.A. 1912, Rosebery-avenue, E.C.
Mitchell, Arthur Oscar, M.R.C.S. 1910, Herne Hill.
Mitchell, George Stanley, L.M.S.S.A. 1916, Herne Hill.
Moore, Benjamin, M.R.C.S. 1907, Oxton.
Morgan, Ethel Mary, M.B. 1910 Lond., Weymouth.
Morrell, Reginald Arthur, M.R.C.S. 1908, Harley-st., W.
Morris, Frederick Temple, M.R.C.S. 1892, Cardiff.
Morrison, Harold, L.M.S.S.A. 1915, Ealing.
Morton, Samuel, M.R.C.S. 1863, Sheffield.
Moxey, Percy, L.S.A. 1906, Dorchester.
Moxon, Alban Henry, M.R.C.S. 1886, Catford, S.E.
Moxon, Alfred, L.S.A. 1886, Kenilworth.
Moxon, Herbert William, M.R.C.S. 1906, Matlock.
Murray, William, M.D. 1862 Durh., Newcastle-on-Tyne.
Nash, Charles Henry, L.R.C.P. Edin. 1903, Mortimer.
Neil, William Fulton, M.R.C.S. 1908, Endsleigh-gardens, N.W.
Noel, Hubert Lewis Clifford, M.R.C.S. 1910, Chingford.
Nolan, Bryan Joseph, L.M.S.S.A. 1910, Southgate.
Norton, Algernon Charles Wodehouse, L.S.A. 1854, Chepstow-villas, W.
Nunn, James Henry Francis, M.R.C.S. 1896, Balham High-road, S.W.
Oakes, Arthur, M.R.C.S. 1853, Birmingham.
O'Brien, Russell James, M.B. 1879 Edin., Maida Hill, W.
O'Donovan, William James, M.R.C.S. 1909, Bow, E.
Oglesby, Henry Newsome, M.R.C.S. 1883, Perry Bar, Birmingham.
Paley, Charles Edward Hewitt, M.R.C.S. 1910, Nottingham.
Palmer, Ambrose Myrie, M.R.C.S. 1872, Chesterfield.
Pank, Philip Esmond Durrell, M.R.C.S. 1916, Chandler's Ford.
Pannett, Chas. Aubrey, M.B. 1906 Lond., Church End, Finchley.

I. (*a*)—*PRACTITIONERS REGISTERED ON THE ENGLISH LIST*—(*Continued*).

Pantcheva, (Mrs.) Elliot Jessie, M.B. 1911 Durh., Judd-st., W.C.
Parker, George Fisher, L.S.A. 1860, Cuckfield.
Perkins, Whitfield, M.D. 1886 Durh., Port Isaac.
Perry, Walter Dymock, M.R.C.S. 1895, Earl's Court, S.W.
Pfeiffer, Albert, M.R.C.S. 1911, Wimpolé-street, W.
Pill, Stanley Victor Percy, M.R.C.S. 1915, Ladbroke-grove, W.
Place, Thomas Lloyd, M.R.C.S. 1865, Oxford-terrace, W.
Pocock, Theodore Charles, M.B. 1906 Lond., Hove.
Polson, James Ronald, M.D. 1903 Birm., Highcliffe, Christchurch.
Ponniah, Sengarapillia, L.R.C.P. Edin. 1914, c/o Surgeons' Hall.
Poole, Kenneth Worsley, M.B. 1890 Durh., Addison Bridge, W.
Pooler, John Read, M.B. 1903 Birm., Westcliffe-on-Sea.
Potts, Matthew Bertram, M.B. 1906 Manc., West Vale.
Price, William Matthews, M.R.C.S. 1896, Christchurch.
Prince, Hugh Tennant, M.R.C.S. 1893, Boston Spa.
Prior, Edward Thurlow, L.S.A. 1877, Loddon.
Provis, Francis Lionel, M.R.C.S. 1898, Hanover-square, W.
Race, Edmund, M.B. 1893 Durh., South Shields.
Ramsbottom, Charles Henry Geoffrey, M.D. 1897 Vict. U., Whitchurch.
Reed, Henry Albert, L.S.A. 1884, c/o O. S. Navigation Co.
Reeve, Edwd. Gordon, M.R.C.S. 1912, Queen's Gate, S.W.
Reid, Sydney Jessie Scott, M.R.C.S. 1913, Cheniston-gardens, W.
Rennie, William, M.R.C.S. 1889, King's Heath.
Rice, Hubert Richard, L.S.A. 1897, c/o Bank of Adelaide.
Roberts, Hugh Corrall, M.R.C.S. 1893, Melton Mowbray.
Roberts, John Dungey, M.R.C.S. 1869, Ealing.
Roberts, Joseph Harry, M.B. 1891 Edin., Hastings.
Roberts, Richard Cadwaladr, M.R.C.S. 1906, Wymeswold.
Robinson, Edmund, M.R.C.S. 1867, Leeds.
Robinson, Norman Battye, M.R.C.S. 1888, Henley-on-Thames.
Robinson, Wm. Newman, M.D. 1868 Q.U.Irel., Ealing Common.
Rogers, Henry Cripps, M.R.C.S. 1865, Lympstone.
Rogerson, Wm. Albert, M.R.C.S. 1914, Leyland, Preston.
Rosenberg, Sophie Sarah, M.R.C.S. 1917, Queen Mary's Hosp. for the East End.
Rowbotham, Edgar Joseph, M.R.C.S. 1894, Clapham Common.
Royle, Elsie Marsh, M.D. 1909 Manc., Wigan.
Ruel, Charles Percival, M.R.C.S. 1889, Southsea.
Ruttledge, Wm. Edwd., M.R.C.S. 1900, R.A.M.C., Blackpool.
Ryan, Thomas, L.S.A. 1882, Kilkenny.
Scott, Ralph Robert, L.R.C.S. Irel. 1853, Bath.
Seagrove, George Mervyn, L.S.A. 1906, Etchingham.
Sear, John Taylor, M.R.C.S. 1896, Enfield.
Seddon, Allan, M.B. 1911 L'pool, c/o Cox and Co.
Seddon, Harold, M.B. 1912 L'pool, Liverpool.
Seon, Greville Ewing, M.R.C.S. 1882, Folkestone.
Shaffi, Mian Mohammad, L.M.S.S.A. 1917, London Hospital, E.
Shah, Bager Zainulabiedin, M.R.C.S. 1914, Miller Hospital, S.E.
Sharpe, Claudius Galen Kaye, M.B. 1910 Leeds, Luton.
Shillingford, Henry Bartlett, L.S.A. 1890, Camberwell, S.E.
Shimberg, Mandell, M.R.C.S. 1917, London Hospital, E.
Simpson, George Barthorpe, L.R.C.P. Ed. 1897, Smethwick.
Sloper, John Smith, M.R.C.S. 1913, Victoria Hosp. for Children, Chelsea.
Snowdon, Alan Richmond, M.R.C.S. 1911, Scotswood.
Somerset, Vere Edward, M.R.C.S. 1911, Finchley, N.
Sommer, Sarah Charlotte Eliza, M.B. 1905 Lond., Hoveringham.
Southern, Francis Gerald, L.S.A. 1884, Llandebie.
Speedy, Robert George Dunell, M.R.C.S. 1888, Bedford
Spencer, John Heatley, M.B. 1906 Lond., Lower Seymour-st., W.
Spillane, Jas. Chas., M.B. 1895 Lond., Royal Societies Club.
Stanley, Charles James, M.R.C.S. 1888, Ealing.
Statter, Henry Bellamy, M.R.C.S. 1890, Bournemouth.
Steel, Henry Golege, L.M.S.S.A. 1912, Southampton.
Stewart, Hugh George, M.D. 1901 Glasg., Normanton.
Stolterfoth, Charles Sigismund, M.R.C.S. 1903, Wallingford.
Sutcliffe, Alan Lee, M.B. 1914 Camb., Burley-in-Wharfedale.
Swindale, Henry Vernon, L.S.A. 1900, Southwick-place, W.
Tetley, Frederick Harrison, L.R.C.S. Edin. 1877, Rugby.
Thirkill, Henry, L.S.A. 1885 Leeds
Thompson, George Hobson, M.R.C.S. 1888, Buxton
Thompson, Maitland, M.R.C.S. 1884, Hemel Hempstead.
Thomson, Arthur Peregrine, M.B. 1915 Birm., Northfield.
Thorburn, Ian Campbell, L.S.A. 1905, Birkenhead.
Thorpe, George Elisha Knight, L.S.A. 1869, Sheffield.
Titterton, Herbert Charles, M.R.C.S. 1902, Hampden Club, N.W.
Todd, John, M.R.C.S. 1865, Mile End-road, E.
Todd, William Fentham, M.R.C.S 1907, New Malden.
Toulmin, Ernest William, M.R.C.S. 1908, St. John's Wood.
Tripp, Basil Hubert Howard, M.R.C.S. 1900, Southwold.
Tucker, Sydney Arthur, M.B. 1909, Lond., Bromley.
Wade, Albert Holland, L.S.A. 1900, St. John's Wood, N.W.
Waldron, Charles Edward M.R.C.S. 1907, London Hospital, E.
Walker, Ernest Ronald, M.R.C.S. 1901, Bromley.
Walker, George, M.R.C.S. 1889, Forest Hill, S.E.
Walker, Jas., M.R.C.S. 1867, Hull.
Walker, Lewis Augustus, M.R.C.S. 1899, Lee-on-the Solent.
Wallace, Gerald Douglas Hamilton, M.R.C.S. 1907, Newtown.
Waltenburg, Theophilus Ralph, L.S.A. 1904, Manchester.
Walter, Ernest William, M.R.C.S. 1878, Stockwell, S.W.
Walters, Enid Margaret, M.B. 1908 Lond, Broadstone, Dorset.
Warburton, John Rollo Noel, M.R.C.S. 1914, West Dulwich.
Warburton, Joseph Wilkinson, M.R.C.S. 1864, Bournemouth.
Ward, Frederic Henry, M.R.C.S. 1865, Ealing.
Warden, Horace, Frederick William, M.R.C.S. 1913, Lexham-gardens, W.
Watson, John Wallace, M.S. 1887 R.U. Irel., Ivanhoe Hotel, W.C.
Webb, Frank, M.R.C.S. 1890, Leigh.
Weizmann, (Mrs.) Vera Rebecca, M.B. 1912 Manch., Rusholme, Manchester.
West, Richard Milbourne, M.R.C.S. 1891, Leicester.
White John Bradshaw, M.D. 1869 Q.U. Irel., Upper Clapton, N.E.
Wilkin, Loftus Ralph, M.R.C.S. 1882, York.
Wilkinson, Lancelot Craven, M.R.C.S. 1914, St. Bart.'s Hospital.
Williamson, William Pettigrew, L.S.A. 1899, Royal London Ophthalmic Hospital.
Wilson, Chas. Wm., M.R.C.S. 1874, Bury St. Edmunds.
Wilson, Mervyn Seppings, L.S.A. 1882, Chippenham.
Wilson, William Bernard, M.R.C.S, 1915, Hackney, E.
Wilton, Stanley, M.D. 1903, Oxfd., East Liss.
Winter, Frank, M.B. 1886 Durh., Newcastle-on-Tyne,
Wolfenden, Richard Norris M.D. 1884 Camb., Sidcup.
Wood, John Askey, M.R.C.S. 1890, Northampton.
Woods, Charles Murray, L.S.A. 1902, Charleville-road, W.
Woolham, Josiah Gilbert, M.B. 1901 Vict. U., Manchester.
Wylie, James Thompson Roy, M.R.C.S. 1892, Sallins.
Young, Campbell, M.R.C.S. 1916, West Worthing.
Young, Roy Frew, M.B. 1909 Camb., Glasgow.
Zarchi, Smerka, L.M.S.S.A. 1913, Russian Law Bureau.

I. (*b*)—PRACTITIONERS REGISTERED ON THE COLONIAL LIST.

Communications in regard to this list should be sent to the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1.

Abbott, Nigel Basil Gresley, M.B. 1916 Adelaide, Cheltenham Gen. Hosp.
Bharucha, Kaikhusru Byramji, L.M.S. 1914 Bombay, Brighton.
Bharucha, Nadir Nasserwanji, L.M.S. 1909 Bombay, Earl's Court, S.W.
Bird, (Mrs.) Mary Adelaide, M.D. 1915 McGill, Gerrard's Cross.
Birrell, William Alexander Hamilton, M.B. 1915 Melb., c/o Bank of Victoria, E.C.
Biswas, Lalit mohon, L.M.S. 1911 Calcutta, c/o T. Cook & Son.
Black, Geoffrey Howard, M.B. 1916 Adelaide, Birmingham.
Blair, Archibald Turner Macleod, M.B. 1906 N. Zealand, Hammersmith Infirmary, W.
Blashki, Eric Philip, *M.C.*, M.B. 1915 Sydney, c/o Bank of Australasia E.C.
Bretherton, Albert Wilber, M.B. 1915 Melb., Bristol.
Brown, Chester Pettit, M.B. 1913 Toronto, No. 4 Canadian Gen. Hosp.
Brownridge, Thomas Roy, M.D. 1916 Man., c/o Army Post Office.
Casserly, Michael Joseph, M.B. 1908 Toronto, c/o Messrs. Holt and Co.
Chaliha, Lakshmi Prasad, L.M.S. 1895 Calcutta, c/o Thos. Cook and Son.
Chand, Amir, M.B. 1913 Punjab, c/o Messrs. H. S. King and Co.
Chohan, Noormahomed Kasembhoy, L.M.S. 1913 Bombay, Cromwell-road, S.W.
Costain, Wm. Alfred, M.B. 1911 Toronto, Lancaster-gate, W.
Das, Premananda, L.M.S. 1899 Calcutta, Edinburgh.
Elliott, Byron Stevenson, M.D. 1907 Toronto, Witley Camp.
English, Robert Joseph, M.B. 1909 Sydney, c/o Bank of N.S. Wales.
Fleming, Thomas Gordon, *M.C.*, M.B. 1909 Adelaide, Torrington-square, W.C.
Fraser, Alexander Clow, M.B. 1915 Melb., Fovant, Wilts.
George, Thomas Edwin, M.B. 1912 Melb., c/o N. Bank of Australasia.
Ghosh, Kiranendu, L.M.S. 1912 Calcutta, c/o T. Cook & Son.
Godby, William Heitland, M.B. 1914 Melb., South Hampstead, N.W.
Griffiths, Ada Isabella Valentine, M.B. 1905 Melb., Evelina Hospital, S.E.
Guest, Edna Mary, M.B. 1910 Toronto, Piccadilly, W.
Hamilton, George Harold Ross, M.B. 1910 Toronto, Swansea.
Hartridge, Oliver Keith, M.B. 1912 Melb., c/o Bank of N.S. Wales.
Hassan, Syed, L.M.S. 1900 Punjab, c/o H. S. King and Co.
Hawthorne, Wm. Stewart, M.B. 1915 Sydney, c/o Holt and Co.
Hewitt, Samuel Ross De Lap, M.B. 1914 Toronto, Woodcote Park, Epsom.
Hodgson, Ronald George Keith, M.B. 1915 N. Zealand, c/o Bk. of N.S. Wales.
Howlett, George Patrick, M.C.P. & S. Ont. 1909, Woodcote Park Epsom.
Jeffries, Lewis Wibmer, O.B.E., M.B. 1907 Adelaide, Hackney-road, N.E.
Joyce, Cecil Roy, M.D. 1914 McGill, Queensboro'-terr W.
Kamdin, Rustom Dossabhoy, L.M.S. 1912 Bombay, c/o Thos. Cook and Son.
Karaka, Dhanjishaw Phiroz-shaw, L.M.S. 1912 Bombay. Kingswood, Bristol.
Kinsella, Malcolm Daniel Boyd, M.D. 1912 Ont., Prince of Wales' Hosp., N.
Kneebone, John Le Messurier, M.B. 1911 Adelaide, Torrington-square W.C.
Laskari, Phiroz Framji, M.B. 1914 Bombay, Brighton.
Lawyer, Annie Amanda, M.D. 1888 Ont., Dawlish.
Leacy, Patrick, M.B. 1916 Ont., Witley Camp.
Leith, George, M.D. 1917 Man., Witley Camp.
Longley, Israel Fletcher, M.C.P. & S. Sask. 1911, Northampton.
McCaffrey, Ernest Moore, M.B. 1916 Sydney, Swansea.
McDonald, Sydney Fancourt, M.D. 1913 Melb., c/o Bk. of Victoria.
Messenger-Pearson, (Mrs.) Stella May, M.D. 1904 Dalhousie, Russell-square, W.C.
Monahan, Richard Joseph, L.M.S. 1907 N. Scotia, P.M.Bd., Torrington-square, W.C.
O'Leary, Ralph Daniel, M.B. 1906 Melb., Chatham.
Oonvala, Jehangir Hormusji, L.M.S. 1910 Bombay, c/o Thos. Cook and Son.
Palmer, John Ernest, L.M.S. 1915 N.B. Co., c/o Bk. of Montreal.
Pettit, Thomas Harold, M.B. 1913 N. Zealand, c/o Bk. of N. Zealand.
Poduval, Ambadi Rama, M.B. 1912 Madras, Birkenhead.
Purves, Allan Melrose, *M.C.*, M.B. 1909 Sydney, Golder's Green.
Rau, B. Kesava Narayana, M.B. 1910 Madras, Oxford.
Robertson, Herbert Donald, M.B. 1911 N. Zealand, Gordon-square, W.C.
Rutter, John Hemphill, M.B. 1907 Melb., c/o Union Bank of Australia.
Sabnis, Ramchandra Dattatraya, M.D. 1915 Bombay, Hampstead, N.W.
Shaw, Thorne William, M.D. 1917 Man., Bellshill.
Short, Hugh, M.B. 1914 N. Zealand, Brompton Hosp., S.W.
Sleeman, Jas. Garnet, M.B. 1915 Melb., c/o Bank of Victoria.
Talati, Jehangir Manekji, M.B. 1913 Bombay, Brighton.
Thompson, Leslie Joseph, M.B. 1912 N. Zealand, Edinburgh.
Thompson, William Barbour, M.B. 1913 Sydney, Lewisham.
Vaidya, Jagannath Balkrishna, L.M.S. 1910 Bombay, c/o Thos. Cook and Son.
White, James Renfrew, M.B. 1912 N. Zealand, c/o Bank of New Zealand.
Woodhouse, Philip Randal, *D.S.O.*, M.B. 1910 N. Zealand, West Kensington, W.

I. (c)—PRACTITIONERS REGISTERED ON THE FOREIGN LIST.

Communications in regard to this list should be sent to the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W.1.

Bertrand, Paul Aime Albert Alex., M.D. 1900 Brussels, Connaught-road, E.
Compeeren, Emile Felix, M.D. 1884 Louvain, Wallington.
Curioni, Fernando, M.D. 1901 Turin, Shaftesbury-avenue, W.
De Bie, Joseph, M.D. 1887 Louvain, Liverpool.
de France, Maurice, M.D. 1908 Ghent, Coventry.
de Francisco, Donato, M.D. 1898 Bologna, Torrington-sq., W.C.
Delbastee, Georges, M.D. 1887 Brussels, Hampstead, N.W.
De Naeyer, Theodore, M.D. 1886 Louvain, Brixton Hill, S.W.
de Neeff, Cesar Victor Emmanuel, M.D. 1902 Brussels, Reading.
Druart, Camille Nicolas, M.D. 1902 Brussels, c/o Cunard S.S. Company.
Green, Fredk., M.D. 1906 Naples, Tottenham Court-road, W.
Grijspeerdt, Simon Benoit, M.D. 1884 Ghent, Forest Gate, E.
Haulet, Leon, M.D. 1898 Liege, Glasgow.
Hermant, Ernest, M.D. 1901 Brussels, King Albert's Hosp., N.
Hottlet, Alfred, M.D. 1886 Louvain, Leigh.
Kemel, Richard, M.D. 1902 Louvain, Liverpool.
Kennis, Theodore, M.D. 1881 Louvain, Westmorland-st., W.
Kesteloot, Michel, M.D. 1905 Ghent, Hadley Woods.
Lauwens, Rene Marie Louis Ghislain, M.D. 1905 Louvain, School of Tropical Medicine, E.
Lemaire, Paul Albert, M.D. 1906 Liege, Folkestone.
Loonus, Hector, M.D. 1894 Louvain, Brixton-hill, S.W.
Maertens, Louis Joseph, M.D. 1880 Louvain, Maidstone.
Mans, George, M.D. 1906 Brussels, Woburn-place, W.C.
Merchie, Edmond, M.D. 1900 Louvain, Brixton-hill, S.W.
Mersch, Edmond, M.D. 1889 Brussels, Woolwich, S.E.
Moreaux, Edouard, M.D. 1894 Brussels, Croydon.
Murdoch, John, M.D. 1911 Brussels, Guilford-street, W.C.
Muyshondt, Henri, M.B.E., M.D. 1899 Brussels, Birtley.
Pattyn, Pierre Antoine Camille, M.D. 1888 Louvain, Farningham.
Renoirdie, Henri, M.D. 1902 Brussels, Bristol.
Sambon, Louis, M.D. 1891 Naples, Shoot-up-hill, N.W.
Schmidt, Roger, M.D. 1905 Louvain, Warwick-street, S.W.
Seeuwen, Henri, M.D. 1888 Ghent, Manchester.
Snocks, Maurice Edouard Remi, M.D. 1910 Ghent, Sidcup.
Thielmans, August, M.D. 1909 Louvain, Talgarth.
Van de Male, George, M.D. 1894 Ghent, Streatham.
Van den Wyngaert, Francis, M.D. 1895 Louvain, Halifax.
Van der Beken, Pierre Mathieu, M.D. 1906 Louvain, Mansfield.
Van der Voordt, Alfred, M.D. 1898 Brussels, King Albert's Hospital, N.
Van Driessche, Albert, M.D. 1910 Louvain, Manchester.
Van Heteren, Clemens, M.D. 1892 Louvain, Teignmouth.
Van Hyfte, Henri, M.D. 1905 Brussels, Birmingham.
Van Mosuenck, Auguste, M.D. 1898 Louvain, Manchester.
Van Raemdonck, Joseph Leonard, M.D. 1909 Louvain, Walmersley, Bury.
Verscheure, Polydore, M.D. 1880 Louvain, Argyle-sq., W.C.
Wigny, Charles, M.D. 1897 Liège, Upper Bedford-place, W.C.
Wulffaert, Franz, M.D. 1912 Brussels, Liverpool.

II.—PRACTITIONERS REGISTERED ON THE SCOTTISH LIST.

Communications in regard to this list should be sent to the Registrar of the Scottish Branch Council, 20, Queen-street, Edinburgh.

Adami, John, Scottish Triple 1917, Sunderland.
Aitken, John Stevenson, Scottish Conjoint 1882, Wakefield.
Angus, William Stephen, M.B. Aberd. 1908, Arbroath.
Annequin, Edgar, Scottish Triple 1916, Glasgow.
Armstrong, Janet, M.B. Edin. 1910, Swansea.
Arnold, John Irwin, Scottish Triple 1912, Enniscorthy.
Baird, John Bruce, *M.C.*, M.B. Glasg. 1910, Glasgow.
Baldwin, Godfrey William Waller de Courcy, Scottish Triple 1889, Liverpool.
Barseghian, (Basil) Mesroob, M.B. Edin. 1914, Manchester.
Bell, George, M.B. Edin. 1892, Belfast.
Bhattacharjee, Monindra Nath, M.B. Glasg. 1917, Glasgow.
Bidie, Evan, Scottish Triple 1902, Braemar.
Birnie, Charlotte Murdoch, M.B. Edin. 1911, York.
Bowie, Thomas Chalmers, M.B. Edin., 1915, Edinburgh.
Braid, (Mrs.) Elizabeth Grace, M.B. Aberd. 1915, Keighley.
Breen, Michael, Scottish Triple 1895, Birmingham.
Brodziak, Edward Lewis Gordon, M.B. Edin. 1914, London.
Bronstorph, Ernest Ebenezer, Scot. Triple 1918, Edinburgh.
Brown, Arthur Campbell, M.B. St. And. 1909, Teignmouth.
Brown, Duncan Francis, M.B. Glasg. 1893, Greenock.
Brown, Francis Frederick, M.B. Aberd. 1913, London
Buckley, Lucy, Scottish Triple 1898, Oldham.
Budler, Arthur Harold de Wet, M.B. Edin. 1916, Edinburgh.
Burge, Arthur Macafee, Scottish Triple 1915, Edinburgh.
Cameron, James Thomson, M.B. Aberd. 1913, Aberdeen.
Cameron, Robert Evan, M.B. Edin. 1914, Edinburgh.
Canekeratne, Walter Edmond, M.B. Edin. 1917, Edinburgh.
Carroll, Patrick, Scottish Triple 1902, Manchester.
Carwithen, (Mrs.) Golfina Maude, M.B. Edin. 1901, Standeford.
Case, Henry William, M.B. Edin. 1893, Manchester.
Chambers, Henry Francis Townshend, Scottish Triple 1889, Surbiton.
Chandler, Fredk. Chas., *M.C.*, M.B. Edin. 1914, Edinburgh.
Chatterjee, Haripado, Scottish Triple 1910, Whalsay.
Christie, Allan Leslie, M.B. Edin. 1912, Edinburgh.
Clarke, Allan Wise, Scottish Triple 1887, Liverpool.
Clayton, William Arthur, Scottish Triple 1898, Preston.
Collett, Edith Grace, Scottish Triple 1892, Sidmouth.
Collins, Henry Frank, Scottish Triple 1907, Edinburgh.
Combe, Frederick Orloff, M.D. Edin. 1889, Bexhill-on-Sea.
Conley, Wallace MacCallum, M.B. Glasg. 1913, Glasgow.
Cook, Oswald, M.B. Edin. 1912, Birmingham.
Cooke, Agnes Elizabeth Mary, M.B. Glasg. 1914, Greenock.
Cosgrove, Charles, Scottish Triple 1913, Edinburgh.
Coutts, Edgar Nesbitt, Scottish Triple 1904, London.
Cowe, John, Scottish Triple 1889, Liverpool.
Craik, William, M.B. Glasg. 1892, Goldthorpe.
Cumming, Robert Scott, *M.C.*, M.B. Aberd. 1915, Aberdeen.
Dakers, Bernard William, Scottish Triple 1906, Brigg.
Dalal, Muljibhai Kuberdas, Scottish Triple 1914, Sheffield.
Davies, George Augustus, M.D. Edin. 1905, Musselburgh.
Davies, Philip Lys, M.B. Edin. 1912, Chislehurst.
Davies-Jones, Charles William Saunderson, M.B. Edin. 1915, Edinburgh.
Davis, Bernard Langridge, O.B.E., M.B. Aberd. 1915, Aberdeen.
Devane, Thos. Francis, Scottish Triple 1892, Oakengates.
Diack, Patrick William, M.B. Aberd. 1891, London.
Dickson, Edward Demetrius Dalziel, M.B. Edin. 1918, Edinburgh.
Dickson, James, *M.C.*, M.B. Edin. 1916, Edinburgh.
Doran, Winnifrid Mary, Scottish Triple 1913, Belfast.
Dorset, Richard, Scottish Triple 1914, Edinburgh.
Drummond, Russell John, M.D. Edin. 1894, Edinburgh.
Drynan, Alex. Erskine, *M.C.*, M.B. Edin. 1911, Edinburgh.
Elliott, John, Scottish Triple, 1897, Beal.
Enright, Maurice Hickey, Scottish Triple 1896, Wigan.
Esterman, Tobius, M.B. St. And. 1915, Dundee.
Evans, Thomas Henry, Scottish Triple 1897, Liverpool.
Ewart, Edward, M.D. Edin. 1902, Gullane.
Ewart, John Hoggan, M.D. Edin. 1897, Hythe.
Fearnside, Clarence Forbes, M.B. Aberd. 1889, Conway.
Ferguson, John Potterton, Scottish Triple 1888, Dunedin.
Findlay, Harry Taylor, M.B. Glasg. 1915, Glasgow.
Fleming James Hamilton, Scottish Triple 1899, Paisley.
Fletcher, Duncan, Scottish Triple 1895, Portree.
Forsyth, William, Scottish Conjoint 1875, Abingdon.
Gadgil, Bhaskar Balwantrao, M.B. Edin. 1916, Edinburgh.
Garewal, Ajab Singh, M.B. Edin. 1917, Edinburgh.
Geale, William James, Scottish Triple 1906, Edinburgh.
Gemmill, William, M.B. Glasg. 1901, West Bridgford.
Giblin, Arthur Leslie, Scottish Triple 1916, Edinburgh.
Gillespie, John Marchbank, *M.C.*, M.B. Edin. 1911, Swansea
Girvan, Alexander, M.D. Glasg. 1904, London.
Glaister, Joseph, M.B. Glasg. 1905, London.
Goldberg, Harry Raephal, M.B. Edin. 1918, Haddington.
Gordon, William Gordon, M.B. Aberd. 1905, Malvern.
Granger, Robert Fawcitt, Scottish Triple 1889, Liverpool.
Grant, George Reginald, *M.C.*, M.B. Edin. 1913, Edinburgh.
Gray, David George, M.B. Edin. 1907, Belfast.
Gray, Francis Audubon, Scottish Triple 1902, Armagh.
Griffiths, Alfred Thomas, Scottish Triple 1897, Cleckheaton.
Gwynne, Joseph Robert, Scottish Triple 1913, Liverpool.
Harley, Richard James, Scottish Triple 1903, London.
Harmer, Mary, Scottish Triple 1895, London.
Hawthorne, Walter Llewellyn, Scottish Triple 1893, Lucan.
Hay, Jane Elizabeth, M.B. Edin. 1916, Dumfries.
Haynes, Harold Cranwell Aloysius, *M.C.*, Scottish Triple 1916, Edinburgh.
Henderson, Janet Fraser, M.B. Glasg. 1915, Glasgow.
Henderson, John Dunlop, M.B. Aberd. 1904, Aberdeen.
Henderson, Norman Keane, M.B. Edin. 1916, Southport.
Hennessy, Joseph Martin Reeves, Scottish Triple 1912, London.
Henry, David Colvin, M.D. Edin. 1910, Great Yarmouth.
Hetherington, George Mundell, M.B. Glasg. 1916, Tillicoultry.
Heyliger, Ernest Denny Scott, M.B. Glasg. 1892, Blackburn.
Hickey, Daniel John, Scottish T.iple 1911, Blaengarw.
Hill, James Rowland, M.B. Edin. 1907, Coleraine.
Hope, Charles Milburn, M.B. Glasg. 1900, Market Drayton.
Hopkins, William Edward, Scottish Trlple 1909, Carnarvon.
Huie, Henry Greville, M.D. Edin. 1393, Droxford.
Hunter, John Arnold, M.B. Edin. 1896, Whitehead.
Hunter, John Henry Graham, M.B. Edin. 1913, Edinburgh.
Hutchison, Alice Marion, M.B. Edin. 1905, Edinburgh.
Hyam, Samuel Priestly, M.B. Edin. 1894, Edinburgh.
Jackson, George Fortesque, Scottish Triple 1894, Sutton Coldfield.
James, Arthur Edwin, Scottish Triple 1914, Edinburgh.
Jeffcoat, Leslie Fraser Eiloart, M.B. Edin. 1914, London.
Johnson, Frank Davidson, Scottish Triple 1914, Edinburgh.
Kaushosh, Ramchander, Scottish Triple 1913, Liverpool.
Keiller, Alexander John, Scottish Triple 1889, New Pitsligo.
Kerr, Felix Arthur, M.B. Glasg. 1912, North Shields.
Kidston, Noel Wallace, M.B. Edin. 1906, Liverpool.
Lamberton, James, M.B. Edin. 1912, Sheffield.
Langley, William Johnson, Scottish Triple 1892, Basingstoke.
Lee, James, M.D. Edin. 1902, Belfast.
Lee, Ying Chuen, M.B. Edin. 1917, Edinburgh.
Levy, Louis, M.B. Edin. 1914, Edinburgh.
Lincoln, Hugh Percival Witwell, Scottish Triple 1894, Manchester.
Lloyd-Jones, John Richard, Scottish Triple 1890. Nundle, N.S.W.
McCune, Lancelot Gordon, M.B. Edin. 1907, Belfast.
Macdonald, Angus, M.D. Edin. 1912, Plymouth.
Macdonald, Frank Bedingfeld, M.B. Edin. 1895, Northampton.
Macdonald, Philip Norman Mackay, M.D. Edin. 1904, Tiverton.
Macdonald, William, M.B. Edin. 1912, Edinburgh.
McGregor, John, M.B. Glasg. 1873, Ardgay.
Mackenzie, Hugh Munro Macleod, Scottish Triple 1894, Clevedon.
Mackie, George, D.S.O., M.B. Edin. 1899, Malvern.
Mackillop, Margaret Helen, M.B. Glasg. 1913, Glasgow.
McKinnon, Neil Charles, L.R.C.S. Edin. 1885, Sonya, Canada.
Macknight, William Crawfurd, M.B. Edin. 1892, Liverpool.
Macleod, Herbert William George, M.D. Edin. 1895, London.
McNeill (Mrs.), Katharine Beatson Arbuckle, M.B. Edin. 1908, Llanelly.
Macphail, Norman, M.B. Aberd. 1912, Ballindalloch.
Macrae, Farquhar, M.B. Aberd. 1887, London.
McRobbie, Alexander, M.B. Aberd. 1904, Banchory.
McWillie, John George, M.B. Aberd. 1896, Hull.
Malone, Reginald Hampstead, Scottish Triple 1918, London.
Marshall, Thomas, Scottish Triple 1891, Liverpool.
Martin, John, Scottish Triple 1914, Glasgow.
Martyn-Clark, Robert Eric Noel, Scottish Triple 1913, Edinburgh.

II.—*PRACTITIONERS REGISTERED ON THE SCOTTISH LIST—(Continued).*

Mason, George William, Scottish Triple 1912, Pontypool.
Mason, (Mrs.) Margaret Baillie, M.B. Glasg. 1907, Glasgow.
Matheson, Farquhar William, M.B. Edin. 1883, Cwmtwrch.
Maunsell, Daniel Beresford, M.B. Edin. 1910, Edinburgh.
Mavor, George Alexander, M.B. Aberd. 1899, Hounslow.
Maynard, Frederick Arthur, M.B. Edin. 1890, Trealaw.
Meek, Donald, M.B. Glasg. 1912, Glasgow.
Melrose, Thomas Robert Gray, Scottish Triple 1912, Edinburgh.
Metcalfe, Thomas Marshall, Scottish Triple 1916, Glasgow.
Miller, John Albert Henry, Scottish Triple 1907, Musselburgh.
Milne, John Brownlee, M.B. Edin. 1900, Montrose.
Mitchell, Andrew Ronald, M.D. Glasg. 1911, Glasgow.
Mitchell, Mary Cochrane, M.B. Glasg. 1909, Milton of Campsie.
Mondon, Vilcourt Pierre, M.B. Edin. 1910, Blaina.
Monro, David Carmichael, M.B. Edin. 1911, Edinburgh.
Moore, Francis Laird, M.B. Edin. 1910, Bideford.
Morrow, Hans Lowry, M.B. Edin. 1909, Enfield.
Moxon, Benjamin Howard, L.R.C.P. Edin. 1871, Hull.
Munro, Donald George Macleod, M.D. Edin. 1902, Maidenhead.
Munro, Janey Lamond, M.B. Glasg. 1915, Glasgow.
Murchie, Findlay, M.B. Glasg. 1909, Glasgow.
Murray, William Henry, M.B. Glasg. 1888, London.
Muterer, James George, M.B. Aberd. 1908, Aberdeen.
Nevett, Alfred Jebb, Scottish Triple 1894, Stockport.
Nicholson, Balfour Stewart, M.B. Glasg. 1893, Derby.
Nicolson, Samuel, Scottish Triple 1896, Glasgow.
Noble, Alexander, M.B. Aberd. 1906, Laurencekirk.
O'Neal, Charles Duncan, M.B. Edin. 1904, Fulwell.
Pallett, William Horner, M.B. Edin. 1914, Edinburgh.
Palmer, Percy Gerald, M.B. Edin. 1908, Edinburgh.
Patterson, William John, M.B. Edin. 1904, Worthing.
Paul, David Hutcheon, M.D. Edin. 1909, Manchester.
Paxton, Arthur Geoghegan, M.B. Glasg. 1905, Glasgow.
Pedroza, John William, Scottish Conjoint 1883, London.
Penfold, William James, M.B. Edin. 1896, London.
Platt, Garfield Arthur, Scottish Triple 1913, Edinburgh.
Power, Francis Grene, Scottish Triple 1912, Edinburgh.
Prentice, Adam, M.B. Edin. 1916, Edinburgh.
Proctor, George Bridgeford, Scottish Triple 1889, Walton-on-Thames.
Raffan, George, M.D. Edin. 1913, London.
Ramsay, Maxwell, M.B. Edin. 1911, Edinburgh.
Randell, Henry St. John, M.B. Edin. 1901, Aldershot.
Reed, Kathleen, Scottish Triple 1909, Dublin.
Rees, John Edward, Scottish Triple 1913, Gwaun Cae Gurwen.
Reid, James, M.B. Aberd. 1904, Dublin.
Reid, Spence Daer, M.B. Edin. 1911, Edinburgh.
Richards, Arthur James, Scottish Triple 1893, Liverpool.
Ritchie, Duncan, Scottish Triple 1897, Dundee.
Ritchie, Frederick, M.B. Aberd. 1913, Aberdeen.
Roberts, Charles Howard, Scottish Triple 1893, Devonport.
Robertson, George Henry Whiteside, M.D. Edin. 1913, Westcliff-on-Sea.
Robertson, Margaret Eason, M.B. Glasg. 1909, Glasgow.
Robertson, Stuart Dewar, M.B. Glasg. 1914, Glasgow.
Rose, John Alexander, M.B. Aberd. 1897, Salop.
Russell-Cargill, James Alexander M.B. Edin. 1908, London.
Ryle, Arthur John, M.B. Edin. 1900, Colwyn Bay.
Sardesai, Dinkar Sakharam, Scottish Triple 1909, Edinburgh.
Saunders, Benjamin Theodore, M.B. Aberd. 1913, Aberdeen.
Saville, William Henry, Scottish Triple 1887, Manchester.
Scales, Cuthbert, *M.C.*, M.B. Edin. 1913, Bradford.
Scott, Archibald Alastair Bruce, M.B. St. And. 1916, St. Andrews.
Scott, Hon. George Hepburne, M.B. Camb. 1898, London.
Scott, James McAlpine, M.D. Glasg. 1913, Congleton.
Sells, Hugh Lancelot, M.B. Edin. 1906, Edinburgh.
Shiels, Peter McLaren, M.B. Edin. 1913, Edinburgh.
Sinclair, Agnes Brymner, M.B. Glasg. 1900, Greenock.
Sinclair, James Edward, Scottish Conjoint 1883, Aldeburgh.
Sleigh, George Baird, M.B. Aberd. 1903, Broughty Ferry.
Smith, Clifford Halliday Kerr, *M.C.*, M.B. Edin. 1914, Humbie.
Smith, Edwin Charles Allan, Scottish Triple 1911, Perth.
Smith, George McCall, M.B. Edin. 1904, Perth.
Smith, John Kenneth, M.B. Glasg. 1914, Glasgow.
Smithies, Walter, M,B. Edin. 1912, Atherstone.
Standring-Smith, Robert Charles, M.B. Edin. 1905, Ipswich.
Stephens, Riccardo, M.B. Edin. 1893, Brora.
Steuart, Roger St. Clair, M.D. Edin. 1908, Edinburgh.
Stewart, Arthur Ford, M.B. Glasg. 1909, Glasgow.
Stewart, Henry, M.B. Glasg. 1914, Glasgow.
Stewart, James David Grahame, M.B. Edin. 1910, Edinburgh.
Stewart, William Ross, M.B. Edin. 1812, Edinburgh.
Strachan, Benjamin, M.B. Glasg. 1877, Cotherstone.
Strong, Clement Percival, M.B. Edin. 1900, Woking.
Sullivan, Patrick, Scottish Triple 1895, London.
Swaffield, Walter Henry, M.D. Edin. 1903, London.
Swan, James Douglas Carnon, M.B. Glasg. 1899, Glasgow.
Symons, Thomas George Gordon, Scottish Triple 1892, Southsea.
Tait, John, Scottish Triple 1893, Alyth.
Taylor, Robert Scott, M.B. Glasg 1907, Johnstone.
Telford, Robert Whitson, M.D. Edin. 1909, Edinburgh.
Thomas, Adolphe Harrison, M.B. Edin. 1881, Thornton Heath.
Thomas, William James, M.D. Edin. 1889, Sutton.
Thomson, Henry James, M.D. Aberd. 1910, Alford.
Thomson, Peter, M.B. Glasg. 1893, Glasgow.
Tibbles, Joseph Russell, M.B. Aberd. 1915, Melton Mowbray.
Turnbull, Arthur, M.B. Glasg. 1909, Glasgow.
Valentine, Gilbert Enos, M.B. Aberd. 1914, Montrose.
Vickerman, Philip Seston, O.B.E. M.B. Edin. 1905, London.
Walker, Wm., *M.C.*, M.B. Aberd. 1914, Newcastle-on-Tyne.
Walker, William James Alexander, M.B. Glasg. 1897, Glasgow.
Wallace, Robert, M.B. Edin. 1918, Edinburgh.
Wang, Chung Ching, M.D. Edin. 1916, Edinburgh.
Ware, Samuel Middleton, Scottish Triple 1908, Edinburgh.
Warwick, Hugh Fleming, *M.C.*, M.B. Glasg. 1904, Millom.
Watson, Frederick Robert, Scottish Triple 1909, Edinburgh.
Wedgwood, Percy Ashworth, Scottish Triple 1898, York.
White, John Duncan, M.B. Edin. 1917, Edinburgh.
White, Rosina Jane, Scottish Triple 1898, Leith.
Whittingham, Harold Edward, M.B. Glasg. 1910, Glasgow.
Wilkinson, Ada, M.B. Edin. 1902, Birmingham.
Wilkinson, Albert Robinson, Scottish Triple 1896, Worthing.
Wilkinson, Stephen Harold, M.B. Edin. 1910, Woodhall Spa.
Willcox, Frank Mayes, M.B. Edin. 1896, Edinburgh.
Wilson, Alexander Fraser, *M.C.*, M.B. Edin. 1889, London.
Wilson, Donald McDonald, *M.C.*, M.B. Edin. 1911, Greenock.
Wilson, Henry, M.B. Glasg. 1881, Dunblane.
Wilson, Robert Murray McCheyne, Scottish Triple 1911, Edinburgh.
Wright, Bertram Ernest, M.B. Edin. 1914, Edinburgh.
Wright, Reginald Harcourt, Scottish Triple 1893, Manchester.
Young, Andrew Morton, M.B. Glasg. 1913, Glasgow.
Young, George, M.B. Glasg. 1905, Liscard, Cheshire.
Young, Robert Henry, M.B. Glasg. 1883, Southend-on-Sea.

III.—PRACTITIONERS REGISTERED ON THE IRISH LIST.

Communications in regard to this list should be sent to the Registrar of the Irish Branch Council, 35, Dawson-street, Dublin.

Ainley, John Francis, M.B. Q.U. Belf. 1917, Belfast.
Beasley, Henry Cecil, Irish Conjoint 1893, Selby.
Beatty, James, M.B. Univ. Dubl. 1895, Northampton.
Beatty, Thomas Edward Bellingham, L.M. Univ. Dubl. 1915, Monkstown.
Bonis, Francis William, M.D. Univ. Dubl. 1898, Mullingar.
Bourns, Charles, Irish Conjoint 1870, Oxted.
Byrne, Daniel Joseph, L.A.H. Dubl. 1914, Tullow.
Casey, Philip Forth, Irish Conjoint 1872, Kew Gardens.
Clarke, James Kilian Patrick, M.B. R.U.I. 1908, Oakham.
Clarke, John Andrew, M.B. R.U.I. 1909, Dublin.
Clerke, Jonathan, Scotch Conjoint 1886, Dublin.
Collen, George Denbigh, M.B. Univ. Dubl. 1897, London, N.7.
Condell, William Haskins, Irish Conjoint 1912, Hetton-le-Hole.
Craig, Eric William, M.B. Univ. Dubl. 1915, Dublin.
Crosbie, Frank, M.B. Univ. Dubl. 1911, Dundrum.
Curry, Stephen Henry, Irish Conjoint 1902, London, S.W.
Curtin, Patrick James, Irish Conjoint 1885, Dublin.
Devlin, Henry William, Irish Conjoint 1890, Ballygaveen.
Dimond, William Elliot Randall, Irish Conjoint 1915, Maryborough.
Dobbyn, Michael Gilbert, Irish Conjoint 1891, Bristol.
Dooley, George Gerald, Irish Conjoint 1889, York.
Dowling, Ignatius Alphonsus, Irish Conjoint 1911, Manchester.
Doyle, Joseph Stanislaus, M.B. R.U.I. 1908, Enniscorthy.
Dunlop, Joseph Everard, M.D. R.U.I. 1890, London, W.1.
Dunlop, Peter, Scotch Conjoint 1882, London, E.7.
Ennis, John Cormac, L.M. Univ. Dubl. 1895, London, W.1.
Falkiner, John McIntire, Irish Conjoint 1890, London, E.4.
Fausset, Robert Rowley, Irish Conjoint 1909, London, W.
Foley, Cornelius, Irish Conjoint 1902, Horsley Woodhouse.
Foley, Edward Green, Irish Conjoint 1914, Sutton Cross.
Foran, John Joseph, Irish Conjoint 1911, Thornton Heath.
Gubbins, Robert Joseph, Irish Conjoint 1882, Killmallock.
Gwynn, Eileen Gertrude, M.B. Univ. Dubl. 1916, Dublin.
Halpin, Richard Stopford Gilbert, M.B. Univ. Dubl. 1913, Neyland.
Heron, James Mathew, M.D. Univ. Dubl. 1891, London, S.W.
Hill, John Francis, M.B., N.U.I., 1912, Cardiff.
Holmes, Reginald, M.D. Univ. Dubl. 1907, Gravesend.
Hopkins, Frederick, M.B. Belf. 1917, Belfast.
Johnston, Robert Henry, M.B. Dubl. 1878, London, N.W.
Keane, Percival Maurice, Irish Conj. 1907, Stoke Newington.
Kelly, Richard, M.B. Univ. Dubl. 1905, Huddersfield.
Kennedy, Arthur Patrick, Irish Conjoint, 1913, Clonmel.
Kilgariff, Joseph O'Loughlin, M.B. Univ. Dubl. 1889, Manchester.
Kirwan, Frederick Michael, Irish Conjoint 1911, Limerick.
Landy, Michael Joseph, M.B. R.U.I. 1903, Burnham.
Lapper, Cecil Lindsay, Irish Conjoint 1912, Dublin.
Latimer, Gordon Dill, M.B. Belf. 1913, Belfast.
Levins, James Mary Joseph Allen, L.A.H. Dubl. 1913, Dublin.
Lyden, Michael Augustine, Scotch Conjoint 1881, London.
Lynam, Bernard Malachy. Scotch Conjoint 1917, Bellaghy.
Lyons, John Francis, Irish Conjoint 1915, Clontarf.
McCausland, Joseph, M.B. R.U.I. 1908, Raphoe.
McCloy, John Moorcroft, M.B. R.U.I. 1909, Belfast.
McCowe, Samuel, Scotch Conjoint 1882, Dublin.
McCreery, Arthur Lonsdale, M.B. Belf. 1915, Belfast.
MacErlean, Donagh Aloysius, M.B. N.U.I. 1913, Dublin.
MacLulich, John Peers, M.B. Univ. Dubl. 1896, Edinburgh.
MacMahon, Augustine Patrick, M.B. R.U.I. 1907, Dublin.
McMurray, John, M.B. R.U.I. 1907, Manchester.
MacSweeney, John Alphonsus, Irish Conjoint 1917, Dublin.
MacSwiney, Thomas Stephen, M.B. R.U.I. 1891, Barnsley.
McVittie, Arthur Craigie, M.B. Univ. Dubl. 1898, Rugeley.
Maguire, William Joseph, M.B. R.U.I. 1894, Belfast.
Minchin, Edward John, Irish Conjoint 1884, London, E.4.
Montford, Archibald Henry, M.D. Univ. Dubl. 1875, Monkstown.
Moorhead, William StLeger, Irish Conj. 1907, London, W.
Moriarty, James Joseph Patrick, M.B. N.U.I. 1915, Dublin.
Mosley, Reginald Lawson, Irish Conjoint, 1880, Long Eaton.
Mulligan, Michael John, M.B. R.U.I. 1908, Athlone.
Murphy, Walter Joseph, Irish Conjoint 1901, Ballinakill.
Nicholson, John Francis, M.B. Univ. Dubl. 1903, Lisçard.
O'Callaghan, Maurice Ahern, Irish Conjoint 1911, Dalkey.
O'Connell, Mathew Daniel, M.D. Belf. 1869, Tadcaster.
O'Donoghue, James Bennett, L.A.H. Dubl. 1911, Dublin.
O'Ferrall, Lewis Richard More, Irish Conjoint 1899, Bristol.
O'Gorman, Michael Charles, Irish Conjoint 1888, Aughrim.
Oldham, Ralph Stransham, M.B. Univ. Dubl. 1906, Sutton.
O'Kelly, John Joseph, Irish Conjoint 1912, Dublin.
O'Neil, James Arthur, L.A.H. Dubl. 1887, Colyton.

III.—*PRACTITIONERS REGISTERED ON THE IRISH LIST—(Continued).*

Ormsby, William, Irish Conjoint 1903, Roscommon.
O'Reilly, Patrick Joseph, Irish Conjoint 1914, Dublin.
O'Sullivan, Daniel, Scotch Conjoint 1884, Killarney.
Parker, William Patrick Hugh, Irish Conj. 1910, Glenageary.
Patton, Grahame, Irish Conjoint 1908, Long Eaton.
Pereira, John Michael, L.A.H. Dubl. 1913, London.
Pierce, Michael Joseph, Irish Conjoint 1908, Wrexham.
Phillips, Frank Gaedt, Irish Conjoint 1919, Dublin.
Porter, Joseph, M.B. Belf. 1913, Wigan.
Purcell, Edward, Irish Conjoint 1905, Dublin.
Quin, Henry Christian Ernest, Irish Conjoint 1901, Barnstaple.
Raj, Balapershad Shiv, Scotch Conjoint 1913, Dublin.
Rea, Robert James, M.B. Belf. 1914, Belfast.
Redelinghuys, Antoine Chiappini, M.B. Univ. Dubl. 1912, Dublin.
Rice, William, Irish Conjoint 1901, London, E.
Richards, Charles Maurice, Irish Conjoint 1892, Cookstown.
Richards, Henry Edward Sutherland, M.B. R.U.I. 1901, Liverpool.
Richardson, Samuel Robert, M.D. Univ. Dubl. 1910, Dublin.
Robinson, Edith, M.B. Belf. 1914, Whitehead.
Robertson, Walter Bold, M.D. R.U.I., 1897, Belfast.
Russell, Mortimer McGee, M.B. Univ. Dubl. 1916, Booterstown.
Rutherford, William George, Irish Conjoint 1885, Hanslope.
Ruttledge, Thomas Wilson, M.B. N.U.I. 1910, Dublin.
Savage, John Joseph, Irish Conjoint 1885, Rockferry.
Scott, Wm. Sydney Jebb, M.B. Univ. Dubl. 1881, Lymington.
Sheffield, William Henry, M.B. R.U.I. 1909, London, E.
Shortt, John William, Irish Conjoint 1899, Southport.
Sinnott, Thomas Joseph, Irish Conjoint 1913, Dublin.
Smith, George, Irish Conjoint 1875, Southsea.
Smullen, John Alexander, Irish Conjoint 1907, Dublin.
Smyth, Frederick Gerald, M.B. Belf. 1915, Belfast.
Smylie, John Dryden, M.D. Univ. Dubl. 1897 Dublin.
Somerville, Thomas Townsend, Irish Conjoint 1871, Sheffield.
Stubbs, John William Cotter, M.B. Univ. Dubl. 1913, Dublin.
Sweeney, William David, Scotch Conjoint 1891, Manchester.
Thompson, Gordon Moffat, M.B. Univ. Dubl. 1894, Liverpool.
Thompson, Thomas Rolland Stewart, M.B. Belf. 1916, Belfast.
Thunder, Wilfred, M.B. Univ. Dubl. 1904, Salop.
Tidmarsh, James Moriarty, Irish Conjoint 1887, Luton.
Tobias, William Oliver, M.B. Univ. Dubl. 1914, Dublin.
Tyrrell, William, M.B. Belf. 1913, Belfast.
Villiers, Henry John, Irish Conjoint 1915, Dublin.
Wallace, Edward Chapman, Irish Conjoint 1911, Limerick.
Wallace, Vivian, Irish Conjoint 1911, Multyfarnham.
Walters, Mortimer, Irish Conjoint 1906, Dublin.
Waters, Christopher, Irish Conjoint 1902, Dundrum.
Watson, James Samuel, Irish Conjoint 1895, Poole.
Weldon, Robert Percy, Irish Conjoint 1914, Epsom.
White, Henry Heathcote, M.D. Univ. Dubl. 1905, Norwich.
White, James Ross, M.B. Belf. 1912, Ballyshannon.
Young, Charles Henry, M.B. Nat. Univ. Irel. 1918, Carrigaline.

INTERNATIONAL SOCIETY OF SURGERY:

THE PARIS CONGRESS.

(FROM A SPECIAL CORRESPONDENT.)

THE fifth congress of the International Society of Surgery was held at Paris from July 19th–23rd, under the vivacious presidency of Professor W. W. KEEN of Philadelphia, the G.O.M. of surgery in the United States, the fourth having taken place at New York in April, 1914. At a preliminary meeting held on Sunday afternoon and attended by delegates from many countries it was found necessary to raise the triennial subscription from 50 to 75 francs. It was determined that Germans, Austrians, and Turks should be excluded from membership, and the action taken by the English, French, and Belgian delegates in 1917 was thereby confirmed. Poles, Czecho-Slavs, and Neo-Greeks (i.e., Smyrna and Jugo-Slavs) were readmitted, whilst a new committee representing South America was created. Very complete arrangements had been made for the work of the Society at the Faculty of Medicine by the French surgeons, whilst the committee of ladies, with the kind help of Madame Lorthioir, made the ladies' visit equally successful. In the minds of all, however, there was a feeling of personal loss in the absence of Madame Depage—drowned in the *Lusitania*—who at all previous meetings of the society had been a most charming and indefatigable hostess.

Inaugural Meeting.

Each morning of the week was devoted to visiting the hospitals and clinics, whilst on every afternoon there was a scientific meeting, which began at 2 o'clock. The inaugural meeting was held on Monday afternoon, July 19th, with an address from M. HONNORAT, the Minister of Education, who introduced the Daylight Saving Bill in France. Addresses were also delivered by M. HARTMANN, F.R.C.S. Eng., President of the National Committee for France; by M. WILLEMS, President of the International Committee; and by Dr. MAYER, the secretary-general, who gave an account of the affairs of the society since its last meeting in the United States in 1914. Professor KEEN, the President, then delivered an inaugural speech "on some of the ideas which, as doctors, we ought to defend." He dealt with the education of a doctor, scientific research, professional conscience, venereal disease, the altruism of the medical profession, and the value of total abstinence. Lastly, he spoke of the courage shown by doctors not only on the battlefield but during civil epidemics. The address, delivered in English, was listened to with rapt attention by an audience which filled the large amphitheatre of the École de Médecine, and for the benefit of those whose English was not fluent Professor Keen had thoughtfully provided a French translation. The formal meeting then closed, and the serious business of the session commenced.

Scientific Proceedings and Discussion.

Surgical hæmatology.—M. DEPAGE and M. GOVAERTS communicated on the first day a report upon the results obtained by the examination of the blood in cases of anæmia due to hæmorrhage. They showed that intravenous injections of salt are useless after severe hæmorrhages; that post-hæmorrhagic anæmia does not reach its maximum until three days after the bleeding has taken place; that leucocytosis, and not a diminution of the red blood corpuscles, is the first hæmatological feature in hæmorrhage, and that when injected red blood corpuscles have been properly selected to avoid agglutination, they remain in the blood of the person who receives them for at least ten days.

Dr. E. A. GRAHAM, of New Orleans, read an interesting paper on *Asphyxia*, in which he stated that this condition may be produced by (1) interference with the intake of air; (2) interference with the power of the blood to carry oxygen or to remove carbon dioxide; (3) interference with the circulation of the blood; (4) disturbance of the power of the tissues to utilise oxygen. He pointed out that a change of pressure in one pleural cavity is associated with a similar change in that of the opposite side. Both lungs, therefore, are nearly equally compressed when their expansion is restricted by air or fluid. The commonly accepted condition of "collapse" of one lung with maintenance of respiration by the other does not occur.

Contributions were also made by M. PEUGNIEZ, of Cannes; by M. PUJOL-Y-BRULL, of Barcelona; and by M. DE QUERVAIN, of Berne, on Surgical Hæmatology; by Mr. GIBSON, of New York on Blood Analysis; and by M. REYNÈS, of Marseilles, on the Danger of Urea Retention in the Wounded and those who have undergone operations.

Surgery of the heart and blood-vessels.—Under the chairmanship of M. GIORDANO, of Venice, the second day was devoted to the surgery of the heart and great vessels. Communications on the subject were made by TUFFIER, of Paris; SENCERT, of Strasbourg; GOODMAN, of New York; ALESSANDRI, of Rome; JEANBRAU, of Montpellier; DELAGENIÈRE, of Le Mans; and SOUBBOTITCH, of Belgrade, whilst for want of time no less than 13 papers on the subject had to be taken as read. The wealth of papers showed the interest which the subject excites at present. There was consequently no opportunity for discussion, which, in view of the diversity of opinions expressed, might have proved animated. The general trend of opinion seemed to be that in skilled hands better results were obtained by the suture of wounded vessels than by their ligature, whilst the results obtained by Tuffier in the surgery of the heart were especially gratifying. He showed that in the recorded cases, which now number several hundreds, the mortality is about 50 per cent. after operation, and it is about 5 per cent. higher in stabs than in bullet wounds.

Fractures of the femur.—The interest excited in the treatment of fractures of the femur was shown by the fact that no less than 21 contributions were made to the subject, whilst Major MEURICE SINCLAIR gave an instructive demonstration of his method, partly by means of a well-arranged series of models and partly by

lantern slides. The net result of the day's work is that a new standard of results has been attained, and that much more perfect results are required, both as regards the utility and appearance of the limb, than was formerly accepted. Perhaps there was a little too much dependence placed upon mechanical methods by some of the speakers as against prolonged attention to minute details.

Radiotherapy, with Sir D'ARCY POWER presiding in the absence of the President, occupied the whole of a long afternoon, and 22 papers were offered for the consideration of a large audience. M. REGAUD was especially happy in his report upon the rational basis, technical indications, and general results of radiotherapy in malignant disease. He was followed by Dr. FINZI, who considered the action of radiations on tumours, the type of growth for which radiation should be used, the type of radiation to employ, and the after-effects of treatment.

M. ABBE gave a lantern-slide demonstration of the β and γ rays, and demonstrated the effects of magnetism upon the radium emanations, whilst Dr. COOLIDGE showed an apparatus for taking X ray pictures.

Tetanus.—The last day of the session was devoted to tetanus. Professor Colonel S. L. CUMMINS, A.M.S., introduced the subject by a report on tetanus in the British Army during the European War. He drew attention to the cases of "modified" and "local" tetanus, which were unknown before the use of prophylactic injections of antitetanic serum. He advocated the use of intrathecal injections, supplemented by large doses given into the muscles and subcutaneously.

The General Meeting.

At the general meeting of the society it was determined that the official languages in which contributions might be made were English, French, Italian, and Spanish. The next meeting will be held in England in 1923 under the presidency of Sir William Macewen, C.B., Mr. Charles Ryall becoming delegate; Sir Edward H. Taylor, of Dublin, Mr. J. E. Roberts, of London, and Mr. Gerald Stanley, of Paris, being elected members of the National Committee for Great Britain and Ireland. It was further decided that the subjects for "rapports" in 1923 should be: (1) sero-therapy and vaccino-therapy (except tetanus) in surgical affections; (2) fractures of the base of the skull; (3) malignant disease of the colon; (4) arthroplasty.

The general meeting closed with a vote of thanks to the committee of ladies under the leadership of Madame Lucas-Championnière, Madame Hartmann, and Madame Walther, who had perfected the arrangements for giving pleasure to the ladies who accompanied the members of the society.

Entertainments.

In spite of the fact that things are still far from normal in Paris owing to high prices, early hours, and shortage of small change, the visitors were lavishly entertained, and as the weather was perfect the gardens were used to the best advantage. Professor W. W. Keen, the President of the Congress, gave a reception in the magnificent house of Madame la Comtesse René de Béarn in the rue Saint-Dominique, where there was excellent music; the municipality of Paris received the members of the Congress at the Hotel de Ville; MM. Auvray, Pierre Duval, Faure, Hartmann, Michon, Proust, Robineau, Tuffier, and Walther, the leading surgeon in Paris, invited a large number of members and their wives to dine *al fresco* in the beautiful grounds of the Cercle Interallié in the faubourg Saint Honoré; Mr. Gerald Stanley, F.R.C.S. Eng., gave a dinner to several of the English visitors at his house in Passy; and there was much private entertaining. The public banquet, which is always a feature of congresses and international gatherings, was held at the Palais d'Orsay, whose suite of reception rooms overlooks the Seine. It was attended by over 150 ladies and gentlemen, under the chairmanship of Professor Keen. The chairman, in a series of witty speeches, acted the part of a showman and produced "a lion" to respond to the toast of each country as it was proposed.—The society ended its very successful meeting on Friday, July 23rd, and on Saturday morning 75 members and their wives left Paris on a three days' tour to the battlefields of the North of France.

IMPERIAL CANCER RESEARCH FUND:
ANNUAL MEETING.

THE eighteenth annual meeting of the Imperial Cancer Research Fund was held on July 22nd at the Examination Hall, Queen-square, London, the Duke of BEDFORD presiding. Among those present were Sir Norman Moore, Sir William Church, Sir George Makins, Sir Frederick Andrewes, Sir John Bland-Sutton, Sir Rickman Godlee, Sir John Tweedy, Dr. William Bulloch, Sir G. Sims Woodhead, Dr. B. R. G. Russell, Dr. W. Cramer, Dr. J. A. Murray (director), and Mr. F. G. Hallett (secretary).

The Fundamental Problems of Research.

Sir WILLIAM CHURCH, in moving the adoption of the report, gave a summary of the investigations during the past year, in which he stated that the director had continued the autologous grafting experiments, in which by transplanting an animal's own tumour to a part of its body away from the site of the primary growth, an artificial secondary growth is established. Dr. Murray stated his own view thus:—

"The efforts of many investigators in the period of 1900–1914, in addition to the great mass of facts elicited by the experimental study of cancer in animals, have gradually crystallised informed opinion to the conviction that the fundamental problems of cancer research involve the elucidation of processes which take place inside the parenchyma cells of malignant tumours. Much of the work falling within this period has been planned and interpreted on bacteriological lines, even by those workers who recognised the many differences between cancer and ordinary infectious diseases. The perfect reproduction of the pathological-anatomical features of spontaneous human and animal cancer by transplanted growths has too frequently been taken to warrant us in regarding the cancer cells as a virus implanted in the body to which they are so foreign that their peculiarities may be taken for granted, whereas every advance in our knowledge of them only enhances their similarity to normal cells. The essential differences must therefore be of the most subtle and delicate kind. It was felt that the gross analogy with ordinary infectious diseases underlying earlier work on the immunity to transplanted growths was not leading to positive results applicable to the disease as it occurs naturally. The mechanism of induced resistance to successful grafting is without effect against established transplanted tumours, and it has no influence on recurrence or metastasis of spontaneous cancer. This curious discrepancy, first brought out by the work of Haaland and Russell, is still unexplained. Provisionally it may be assumed that the explanation halts for want of knowledge of imperfectly understood features of cell-life the perversion of which is essential to the cancer process. Instead of elaborating still further the analysis of induced resistance it was considered desirable to break fresh ground and undertake the study of the metabolism of the cancer cell in as many ways as possible.

In the first instance it was decided to investigate the phenomena of cell respiration, normal and cancerous. The reasons for this choice were, firstly, the well-known dependence of cancer cells on close proximity to the blood-supply. The extensive necrosis in rapidly growing tumours is usually seen to affect all the cells with the exception of a narrow layer a few cells thick around the blood-vessels. Secondly, the work of J. C. Drummond had shown that the food necessities, basal and accessory, of tumours correspond so closely to the needs of the normal that it is impossible to influence the growth of cancer cells without jeopardising the life of the host. There was, therefore, not much prospect of discovering vulnerable features in the vital necessities of tumours in this direction."

Methods of Approach.

In pursuing one such investigation Dr. W. Cramer, Sir William Church continued, had examined the action of a number of inorganic substances on cancer cells. The first step in these investigations is to expose emulsions of a transplantable tumour to the reagent in the test-tube, and find out by inoculating the treated emulsion into susceptible animals the amount of damage produced. Salts of cerium were found to be the most active of those tested. Manganese and uranium salts were less potent, and the other elements experimented with were without effect in strengths which could be tolerated by the experimental animals. None of these substances, however, had any influence on growing tumours, a failure probably due to the irregularity of the circulation in the tumours which

delays the access of the reagents to the cells, coupled with their rapid elimination by the kidneys and bowels. This is one of the difficulties which is constantly met with in direct therapeutic experiments on cancer. The cancer cell is so like the normal cells of the body that agencies which destroy it are also dangerous to life.

Before we could plan, Sir William Church said, a rational method of treatment, it would be necessary to know more of the vital processes in cancer cells and the nature of the very delicate differences between them and the normal. A beginning has been made with the study of cell-respiration. Respiration is essentially a combustion process, oxygen being taken in and carbon dioxide given off. These are only the first and last terms, however, of a series of chemical equations, so that there is room for great variety in the intermediate stages, even if the final result should be the same. Dr. A. H. Drew had approached the problem by studying the rate of decolorisation of dilute methylene-blue solution by normal and cancer cells. With this method there is a wide difference between the two, decolorisation being much more rapid with normal cells. Dr. B. R. G. Russell and Dr. W. E. Gye have suspended the tissue emulsions in fully oxygenated defibrinated blood, and measured the rate at which oxygen is abstracted on incubation at body temperature. By this second method the differences are much less pronounced, and it is found that the more rapidly growing tumours, with significant exceptions, absorb more oxygen than those which grow slowly. The investigations are being continued, and give promise of interesting light on this fundamental feature of the life of cancer cells.

The adoption of the report was seconded by Sir JOHN BLAND-SUTTON.

Facilities Offered by the Fund.

The Duke of BEDFORD in moving a vote of thanks to the executive committee and others who have assisted in the work of the Fund during the past year referred to the wide range of investigation covering such important researches as those relating to (1) experimental induction of cancer; (2) respiration in normal tissues, which is a fresh line of research in connexion with cancer; and (3) experiments on the action of chemical substances on cancer cells in the test-tube and in the body, and the very technical investigation of the director on grafting. He noticed with satisfaction that the Fund is again in a position to assist investigators at home and abroad with tumour material for experimental purposes. Speaking of the finances of the Fund, he mentioned that increased expenditure was caused by the full resumption of laboratory research work as well as the enhanced cost of materials. The fixed income of the Fund was £5550, whereas the expenditure was £7000, the difference this year being met by a certain number of subscriptions and legacies. The Fund required at least £1500 a year more to maintain the researches. He referred to the valuable services of Sir Watson Cheyne, who had resigned the post of honorary treasurer, in which he was succeeded by Sir George Makins.

MEDICINE AND THE LAW.

Cremation and the Coroner.

IN the City Coroner's Court recently Dr. F. J. Waldo held an inquest upon the body of a man who had been found unconscious on the pavement and had died after removal to St. Bartholomew's Hospital. Medical evidence was given to the effect that disease of the arteries of the brain was present, and that death was due to cerebral hæmorrhage. There was also evidence that the deceased suffered from financial difficulties and was depressed, although he had appeared to be in his usual health when he left home. Dr. Waldo called attention to the fact that he had to exercise additional care in holding this inquest owing to the fact that the body was to be cremated, and referred to the form which awaited his signature, in consequence of this, as imposing a heavy responsibility upon coroners. Undoubtedly it does so, but at the same time the coroner in any case where suicide is suspected or possible can always safeguard himself by the evidence obtainable after post-mortem examination. Where there is reason to regard foul play as a possible cause of death it is, of course, incumbent upon him to obtain all evidence available to negative that possibility. Otherwise his duties are regulated by the Act of Parliament which imposes them, and as long as he complies with the requirements of the law no more can be expected of him.

Qualified Privilege or Malice.

At Leicester Assizes recently an action for slander and libel was tried before Mr. Justice Horridge and a special jury in which the plaintiff was Dr. J. T. Horron Davies and the defendant Eliza Lady Rolleston. The defendant's husband, Sir John Rolleston, who died early in April, 1919, of myocardial degeneration, was 72 years of age, and had for a long time been a patient of Dr. Davies. He returned from London to his house near Leicester shortly before his death very ill, and at the time of his death was being nursed by a trained nurse as well as by his wife. Shortly before Sir John Rolleston died Dr. J. D. Slight had been called in in consultation and had approved the treatment ordered, including the injection of sedatives, which had been rendered necessary by the patient's restless condition and impetuous temperament. It was not long after the administration of a subcutaneous injection of morphine and atropine that Sir John Rolleston died, and Lady Rolleston, who was distracted with grief and apparently under the impression that the injection had caused death, immediately accused Dr. Davies to his face before her brother-in-law and before servants of being responsible for the catastrophe. She also said to the nurse who administered the injection, "you and he planned it together." Presumably, as counsel observed in his opening speech, no public notice would have been taken by Dr. Davies of the utterances of a widow in the throes of grief, but six weeks later corresponding with Dr. Slight on the subject of her husband's death Lady Rolleston wrote: "Dr. Davies murdered him and all my friends agree with me. You can tell Dr. Davies or show him this letter. I don't care what you do in the matter." Dr. Slight appears to have communicated the contents of this letter to the plaintiff, who thereupon brought an action. In defence there was no plea of justification, the defendant not alleging that there had been wrongful or negligent treatment of the deceased, but "privilege" was claimed for the letter and utterances of the defendant. This plea the learned judge upheld, and left the case to the jury on the question whether there was malice on the defendant's part. The jury found a verdict for £100 damages, and judgment for that sum and costs was entered for the plaintiff.

With regard to the application of the protection of privilege to the occasions referred to above the ruling of the learned judge is not easy to understand. A statement made on an occasion of qualified privilege is *prima facie* protected, but proof of actual malice on the part of the defendant (the duty of proving such malice being on the plaintiff) will rebut the *prima facie* protection thus afforded. Qualified privilege exists on certain fairly well-defined occasions, among which are: (*a*) when statements are made with the object of protecting the writer or speaker to a person who has an interest or duty in connexion with the subject of the statement; (*b*) when the statement is made as to a matter in which there is an interest common to the writer or speaker and the person to whom the statement is made; (*c*) when statements are made in discharge of a legal, moral, or social duty. It is not altogether clear that (*a*) could apply or what interest there was common to Lady Rolleston and the gentleman who had advised in consultation with the plaintiff, or what duty Lady Rolleston had to communicate to him her opinion that the plaintiff was responsible for her husband's death. It may be, however, that the health of the patient and the result of the treatment were considered to be matters in which a common interest existed. As to the matter of duty, moreover, the question is what actually was the defendant's duty irrespective of any belief of the defendant that there was a duty to

make the statement. With regard to the question of malice, the use of excessively strong terms, more violent than the occasion demands, does not necessarily prove malice, but it has been laid down that "the language used in a libel, though under other circumstances justifiable, may be so much too violent for the occasion and circumstances to which it is applied as to form strong evidence of malice upon the issue of whether the communication is covered by privilege and an inference of actual malice may be drawn from its use." Lady Rolleston, no doubt, expressed an honest, and entirely mistaken, belief that her husband had been treated wrongly with fatal results in so vindictive a manner that it amounted to a charge of wilfully committed crime. Such language would constitute an abuse of the privileged occasion.

Poison in Sweetmeats.

At the recent York Assizes a trial was concluded the circumstances surrounding which have attracted some attention. The prisoner, Liddle, was indicted upon a charge of sending poisoned chocolates to a man named Thompson, a market gardener, and to seven other persons who had given evidence in an action arising out of a will in which he claimed an interest. This action had been decided against the prisoner, and the indictment was for sending the sweetmeats with intent to murder, and in an alternative count for sending them with intent to endanger life. Liddle, having been convicted on clear grounds upon the second count, was sentenced to ten years' penal servitude, with a concurrent sentence of five years upon other charges relating to the trial of the will case. The sending of poisoned sweetmeats to a person whom it is intended to injure is not a new idea, but savours in modern times rather of fiction than of fact. The case, however, should be a warning to persons receiving such gifts anonymously unless they have good reason to suspect a friendly donor. It is more easily conceivable that a malevolent person should seek to injure children, and through them to obtain revenge upon their parents, than that one man should send them to another for such a purpose. A market gardener would hardly, it might be thought, be able to avoid having his suspicions aroused by a gift of chocolates from someone unknown. The crime was, however, a very cruel one, and the punishment well deserved.

THE FEDERATION OF MEDICAL AND ALLIED SOCIETIES:

THE FIRST ANNUAL GENERAL MEETING.

THE first annual general meeting of this Federation was held on Tuesday last, at 11, Chandos-street, London, Sir MALCOLM MORRIS, the chairman of the Executive Council, presiding. There was a good representative attendance. The annual report of the Council, adopted unanimously by the preceding business meeting, was taken as read.

ANNUAL REPORT OF THE EXECUTIVE COUNCIL, 1919-1920.

This, the first annual general meeting of the Federation, finds your Executive Council in the happy position of being able to report that much has been accomplished. Much more remains, however, for us to do.

The lines on which it was hoped to develop the constitution of the Federation were, it will be remembered, four in number:—First, that it should consist mainly of representatives of the existing associations and societies in the medical profession; secondly, that it should include representatives of the professions and occupations whose work is allied to medicine; thirdly, that it should link up the medical profession outside Parliament with the members of the profession inside Parliament; and, lastly, that it should include representatives of the whole medical profession as soon as its position warranted that step. Further, it was clearly understood that the Federation was *not* a body with a personal mission to lead the profession, but was designed to provide the medical and allied professions with the means of collective expression in the councils of the nation, to foster unity in the profession and closer relationship with the community, and to safeguard those high principles upon which the practice of medicine has been founded throughout its history. Recognising that opinions differ, it has been the aim of your Council to steer a middle course, and its members, representing as they do many spheres of medical activity, have worked together harmoniously and cordially for the general good.

Corporate and Associate Membership.

Forty-two distinct organisations are now coöperating in the Federation, 24 of these as corporate members and 18 as provisionally represented bodies. In addition a number of others have at times sent representatives. The response from the professions and occupations whose work is ancillary to medicine has been remarkable—dental practitioners, pharmaceutical chemists, nurses and midwives are all represented by their chief organisations; sanitary inspectors and health visitors have offered their coöperation, and industrial medicine, hitherto largely neglected by us as a profession, has found its place within the wide horizon which encompasses the sphere of our interest.

Of the ten medical Members of Parliament (excluding one who, as a Cabinet Minister, is ineligible) nine have joined the Federation as honorary members, and the Medical Committee of the House of Commons has appointed its secretary, Captain W. E. Elliot, M.B., M.P., as its watching representative on the Executive Council. Sir Wm. Watson Cheyne has helped us in many ways and we owe much to the sympathetic coöperation that he and the other members of his Committee have given us. Lord Dawson of Penn, the first and only practising member of our profession in the House of Lords, has continued the support and sympathy which he has from the beginning given to the Federation.

The Council has given its support to two medical candidates for Parliament during the period under review, and was able to circularise all medical and dental practitioners, pharmacists, nurses, and midwives, and insert notices in the medical press, supply speakers, and provide cars for the poll.

The admission of Associate Members was commenced in March this year. A letter and pamphlet has been sent to most of the practitioners in the London district, and is now being sent to provincial practitioners. It has been found that the first issue brought in subscriptions sufficient to practically meet the cost involved, and as applications for membership are coming in in increasing numbers it is confidently expected that before long the limited income required will be available.

The main activities undertaken during the period have been the following:—

In October, 1919, a series of enquiries were sent to the societies coöperating regarding a possible medical service under the Ministry of Health, and designed to show how the interests of practitioners in the various branches of practice might be affected. The replies received have been valuable in the light of subsequent developments. The views of the societies were also obtained in regard to a Pure Milk Bill and other measures of impending legislation on which subsequent representations were made.

Conference on Medical Benefit Regulations.

On Dec. 12th, 1919, at a time when a very large section of the medical profession was much disturbed over the National Health Insurance Medical Benefit Regulations for 1920, a Conference was called at the request of certain of the constituent organisations to consider the higher questions of principle which were at stake and which were tending to be overlooked in the negotiations for higher remuneration. This Conference was productive of most useful discussion, and the following resolutions were adopted:—

1. That in the opinion of this Conference of medical and allied organisations the draft Regulations for 1920 proposed to be made by the Minister of Health with respect to the administration of the National Health Insurance Medical Benefit are not adapted to secure the most efficient service from the medical profession nor adequate results to the community.

2. That a Committee of Inquiry be asked for to take evidence and report.

3. That the resolutions of this Conference be conveyed to the Prime Minister and that he be requested to receive a deputation.

On Dec. 17th a deputation of six members of the Executive Council met the Medical Committee of the House of Commons in conference and secured the support of that Committee for the resolutions adopted at the Conference on Dec. 12th.

It was decided by the Executive Council that the first step in giving effect to the resolutions of the Conference should be to wait upon the Minister of Health, and that the deputation to the Prime Minister, which the Council had been assured would meet with a sympathetic attitude, should be deferred until the recommendations of the Medical Consultative Council of the Ministry had been made known.

On Jan. 23rd the Minister of Health received a strong deputation from the Federation, which was introduced by Sir Wm. Watson Cheyne, Bart., M.P., and was supported by the Right Honourable Sir Henry Craik, M.P., Sir Philip Magnus, Bart., M.P., and Lieutenant-Colonel F. E. Fremantle, M.P. The deputation placed before the Minister the reasons which appeared to necessitate an early, independent, and public inquiry into the working of the Medical Benefit under the Insurance Act. It was pointed out that the Medical Benefit under the Act has been in force for seven years, and that, although it constitutes the greatest experiment in public health legislation ever introduced, no facts are available upon which to judge of its success or failure. Dr. Addison accorded the deputation a most sympathetic hearing, and so far met it as to promise that such an inquiry as was asked for should be held if, on the issue of the Interim Report of his Medical Consultative Council, it could be shown that it would tend to instruct the public or the medical profession.

Support given to Constituent Organisations.

The support of the Executive Council has been sought by a number of representative organisations, notably by the British Dental Association, in urging upon the Secretary of State for War the minimal establishment necessary to secure an efficient permanent Army Dental Corps; by the British Science Guild in regard to State recognition and suitable awards for medical discovery; by the Medico-Psychological Association of Great Britain and Ireland in regard to the need of immediate legislation for the efficient treatment of mental disorders in their early stages; by the College of Nursing, Royal British Nurses' Association, and other representative nursing and midwifery organisations in regard to the need of nursing and allied services being directly represented on the Consultative Council of Medical and Allied Services of the Ministry of Health.

In each case the Executive Council has been able to render real service and its representations have met with a sympathetic reception at the hands of the Ministers concerned.

The Interim Report of Dr. Addison's Consultative Council, on the future provision of Medical and Allied Services, is now before the public and the professions concerned. The Executive Council has been able to give the Report preliminary consideration and has to acknowledge its indebtedness to the Minister of Health for his courtesy in supplying an advance copy, and to Lord Dawson for his readiness in answering many questions which have already arisen.

The necessary legal procedure in regard to the incorporation of the Federation is well forward and should be completed at an early date.

In conclusion, your Executive Council feels encouraged by the progress made in so short a time, which it thinks cannot be considered as other than satisfactory, and confidently looks forward to the future convinced that, continued on the lines originally laid down, the Federation cannot fail to foster greater unity in the medical and allied professions and bring them into closer and more sympathetic relationship with the great British public which they serve.

Signed for and on behalf of the Executive Council by MALCOLM MORRIS, Chairman; N. HOWARD MUMMERY, General Secretary.

A letter of regret was received by the general secretary from Dr. Addison, who wrote saying that pressure of Parliamentary work had put an embargo on all fresh demands on his time, and that it was not from any lack of goodwill that he did not attend the meeting.

CHAIRMAN'S ADDRESS.

Sir MALCOLM MORRIS then delivered an address reviewing the work of the Federation in the first year of its activity. He said:

Initial Success of the Enterprise.

We are not far from the beginning of the task to which we have put our hands; but the rapid accession to our ranks of numbers of the medical and kindred organisations which it is our aim to bring together for counsel and common action warrants the belief that our movement is destined to triumph. Our work has not been favoured by the heavy costs of all the facilities of communication, but this difficulty has been reduced to a minimum by the rigid economy that has been practised. So careful have our officers been that the expenditure for the first year has been kept within the estimate by more than £300, and their ingenuity has enabled them so to lay their plans that during the second year, without loss of efficiency, the expenditure will be still further reduced. That so much progress should have been achieved at so small an outlay is a most gratifying circumstance. As your chairman I should be guilty of gross remissness if I failed to pay a tribute to the work, as discreet as it has been energetic and enterprising, of the members of the Executive Council. They have spared neither time nor toil to further your interests, and I am sure that you will not be lacking in appreciation of their devoted and effective service.

That the evolution of this Federation conforms with the tendencies of the times is sufficiently obvious. The social instinct which prompts corporations to band themselves together for the attainment of common ends has been greatly stimulated as a result of the war. This, indeed, more than anything else, is the keynote of the national reconstruction which is now in progress. Alike in commerce and in industry, in employers and employed, we see a closing up of the ranks, while the nations themselves are striving to form themselves into a league as the one way of saving civilisation from shipwreck. Is it surprising, then, that the medical profession should strive after a Federation of the many organisations which represent its sectional interests, and should hold out the hand of fellowship to the bodies which represent the kindred professions?

The Need for Federation.

The need for such a Federation can be deduced only too easily from the experience of the last few years. Is it possible to maintain that when questions affecting the welfare of the great body of medical men have been before Parliament the profession has been able to pull its full weight? Was it so, for example, when the Health Insurance system was being framed? Certainly it was not. Who that cares supremely for the highest interests of the profession—and among those highest interests I rank its good repute—can look back upon the stormy events of those days without some sense of humiliation? The chaffering in public into which the profession was forced was only too well calculated to give the impression that medical men were thinking very much of their material interests and very little of the nation's welfare. Had there been in existence such a body as the Federation is fast growing to be, how different would have been the beginnings of Health Insurance. The Government would have known at the outset that it had to reckon with a Federation through which were able to speak not only doctors, but also pharmaceutical chemists (who were immediately concerned) and related bodies which had no material interests at stake to deflect their judgment. How could the deliberate conclusions of such a Federation have failed to carry weight with the Government, and with that public opinion which is the final court of appeal.

The need for federation is deducible not less plainly from the multiplicity of existing medical organisations. That there are some 200 separate medical bodies certainly shows that the profession is not lacking in the organising faculty. But is it not evident that the effect of all this organising energy would be vastly strengthened if these 200 bodies were leagued together? They are influential in very different degrees. But were they all federated, the most powerful would have their influence increased tenfold; the least powerful would have their influence increased a hundredfold. These 200 organisations may all, for aught I know, be in the highest state of efficiency, but never will they be able to speak with unimpeachable authority until they have entered into a combination which will enable them to elicit their greatest common measure of agreement. This is no case merely of counting heads. We cannot, indeed, as practical men and women, afford to disregard the weight of numbers, but I attach far more importance to the moral authority which is implicit in the deliberate conclusions reached by men and women of different yet kindred professions who have taken counsel together and can speak not only for those whose interests are directly involved in a given issue, but also for those who can claim the quality of impartiality. No conclusions so arrived at could possibly be waived by the imputation of interested motives.

No Party Politics.

It cannot too often be insisted upon that the Federation knows no party politics. To say that it knows no politics would be absurd, for the most important of its objects is to take political action at every possible opportunity; but it gave its support—its active and influential support, I will say—to Lieutenant-Colonel F. E. Fremantle, who was elected as a Coalition Unionist, and to another member of the profession, Dr. Dunstan, who stood as a Labour candidate, and, though not at the top of the poll, won the second place in the list. And every medical Member but one of the legislature except Dr. Addison, whose office debars him from formal association with a movement with which he has none the less avowed his sympathy—including Lord Dawson, who can speak for us in the House of Lords—belongs to the Federation. The medical Members of the House of Commons now number ten, and we know that they are only the advance guard. Before long, with the active backing of the Federation, their numbers will be multiplied, and the time is at hand when, on all questions affecting health interests, the Whips will have to reckon with a solid phalanx of medical men who will be able to speak with one voice on public health, however much they may differ on other questions.

If any Government starves the Public Health Service we must cry "hands off," and a powerful medical group in the House of Commons will be a bulwark. Behind it will stand the Federation. No longer will it be a "grave defect in medical organisation," to use Dr. Addison's words, that there should be "no body of men in the profession who could be appealed to for judgment on a great public issue." Such a body the Federation is destined to become. That the system known as State medicine will undergo much further development is inevitable. The profession has no alternative but to adapt itself to the nation's needs, whatever form the adaptation may take. That task will require more statesmanship than is to be found in any one of the existing medical organisations, be it never so powerful. It is an enterprise which will tax to the uttermost the statesmanship of the whole profession. If that be so, how can any medical society or association be justified in withholding whatever contributions it can make to the common stock?

Constituent Bodies Maintain their Independence.

Finally, I protest, with all the emphasis at my command, that the Federation is absolutely innocent of any design to supersede the independent action of its constituent bodies. Every such body preserves its full powers of self-determination, and is as free to take individual action on any question as it was before joining the Federation. Naturally, having entered the Federation, it will present for discussion the views which it entertains on any matter of common interest. But whether those views secure the concurrence of the Federation or not it will be absolutely free to take whatever separate action it pleases. The Federation's first and greatest function is that of coördination. Its conferences will all be round-table conferences, in which no priority or predominance can or will be claimed by any. So far from running any risk of absorption, each of the constituent bodies will have its independence established on a more unassailable basis than ever; it will be able to justify its existence in the eyes of those to whom it is responsible by pointing to the results achieved by the allied action in which it has participated, results which will be far superior to any that could have been accomplished by its isolated efforts. The Federation, I boldly assert, has no prejudices, no rivalries, no antagonisms. Its aim is to provide a platform upon which all who are in any way responsible for the health of the nation can meet for free and equal conference with a view to united action.

DISCUSSION.

Captain W. E. ELLIOT, M.P., referring to the great help which the Federation of Medical and Allied Societies could give to Members of Parliament, never more necessary than to-day, said that there were a dozen great questions before the country, nearly all of which must result in some kind of legislative action. If the medical profession spoke unitedly their opinion would be irresistible, otherwise the layman would continue to take his own line of action.

Dr. ARTHUR LATHAM said he thought the Federation had been wise to include other than members of the medical profession in its membership. If the public had not learned to respect the opinions of the medical profession in the past it was due to the fact that the trend of medical discussions had led the public to think that doctors had been actuated by personal motives. The Federation desired nothing more nor less than the interests of the community. He was confident that if health questions were put upon a proper basis, something like that suggested by the Consultative Council, the medical profession with its allied bodies would receive adequate and proper treatment.

Dr. E. H. M. STANCOMBE said that as an individual the medical man was popular, powerful, and respected, but as a member of a public health body his opinion did not carry the weight which it should do.

Dr. HOWARD MARSHALL said that in these days it was difficult to give adequate treatment for serious cases in private houses. Let all hospitals have paying patients for all classes. He explained a system started in Cirencester some years ago which satisfied the people and which was almost self-supporting. The Federation could help to bring all the hospitals in the country into line.

Dr. BLACKHALL-MORISON thought that when voluntary hospitals were transformed into institutions charging fees of different rates subscriptions would cease to come in, and the hospitals would be unable to carry on.

Lord DAWSON of PENN said that in the past the medical profession had been criticised, with some justice perhaps, because it had shown itself unable to lead and to construct policies. This professional individualism was giving way before the necessities of the State and the medical calling was slowly emerging to the more collective point of view. The country had given it the opportunity of showing what it could do, and as a result the medical profession as a body was now looked upon with greater respect. One of the recent efforts on the part of medicine to take its proper public place was the Federation of Medical and Allied Societies, which thus aimed at approaching the difficulties of the future, while the Consultative Council was establishing a nexus between the Government and the medical profession. Some of those who criticised the report of the Consultative Council did not understand its real meaning, while others regarded it as frankly utopian. There was, in fact, a big situation to meet, a situation daily becoming more and more impossible, and in some way or other it had to be met. The medical critics did not recognise the gravity of the present situation or its increasing insistence. What would they put in place of the report? The only alternative was the nationalisation of medicine, whereas the spirit underlying the report was the provision of equipment, leaving the relation between doctor and patient free as before. The scheme was not intended for immediate realisation as a whole; it indicated the direction in which evolution might take place. To build intelligently the builder must first know what he wanted. If the medical reformer to-day had but 2 millions of money at his disposal he would not be so foolish as to fill the country with health centres, but would proceed with caution, acquiring the necessary experience. It was indeed time for the medical profession to think out clearly some organisation whereby this country was to be made healthy. Among the circumstances that would force the pace was the increased demand on the part of the public for better health. He could not recall an instance in which the press had taken such interest in a medical report as in that of the Consultative Council. Medicine would have to identify itself with local health work in each community, and one of the most essential recommendations in the report was that the medical profession should be represented on any new health authority brought into being. The nationalisation of medicine was already taking place while they were talking. There were school, tuberculosis, maternity, and other services set up because the voluntary organisation of the medical profession had not proved sufficient to meet the needs of the community. Proposals for the conduct of the new Bradford infirmaries were being made without adequate consultation with the medical profession; he was told that it was proposed to set up there a whole-time service, and what Bradford did to-day another city might do to-morrow. It might, of course, be the best policy to turn Poor-law infirmaries into a whole-time medical service, but the medical profession ought to realise the significance of this very definite move towards municipal service.

A vote of thanks to the chairman brought the proceedings to a close.

Correspondence.

"Audi alteram partem."

INDUSTRIAL SETTLEMENT FOR THE CONSUMPTIVE.

To the Editor of THE LANCET.

SIR,—In an article with this heading, which appeared in THE LANCET on May 8th, by Dr. P. C. Varrier-Jones and Sir G. Sims Woodhead, the authors say: "The newer conception of the duties of after-care and colony committees is based on the inclusion of the idea of partial if not complete separation or segregation of the tuberculous patient." Their plan is to establish industrial settlements in which the work is, of course, to be performed by sanatorium graduates who are to be paid for their work. The authors first discuss how such industries are to be started, but the statements are vague and no practical conclusions are reached. There is no discussion whatever of the economic questions involved—the subject is merely mentioned—and the commercial principle of supply and demand is wholly ignored. Their chief concern seems to be lest the reader think there will be difficulty in inducing consumptives to accept the gifts so lavishly offered. "Set up your industry and the people will flock to it, but in this instance let the industry be set up for consumptives; let it be run for their particular and special benefit and they will come—and stay." "Suitable work is by no means an unimportant factor in the treatment of the consumptive; indeed, it must be looked upon as the central pivot of the whole system."

The authors next consider skill as it now exists among workmen, and their conclusions are summarised fairly well in the following quotation: "We had first to realise that the working man of to-day has to be trained, in the majority of cases, not as the master of a trade but as a hand in a factory." Next they consider the working ability of sanatorium graduates: "Their strength is certainly diminished and their health impaired, but with encouragement and opportunity, both of which should be freely given, they will be able to contribute very materially to their own support and that of their families. The opportunity to work is what is required, and their earnings, together with a small pension, will in most cases enable them to become self-supporting, certainly to a much greater extent than were they compelled to enter into competition with the healthy worker in the outside world. The sapping of the moral character by gifts and doles should be carefully avoided." What about the pension?

The above quotations are sufficient to show, it is believed, that even from the standpoint of the believer in sanatorium treatment, the plan proposed by these authors is not only visionary and extravagant, but if it were found possible to put into practice the final result would be to pauperise the workers.

From the standpoint of the work of the Thompson Street Rooms, where ambulatory consumptive wage-earners are treated without interruption to work, and where graduates and those still undergoing active treatment are kept under control and observation for years, the practice of sending ambulatory consumptive wage workers first to a sanatorium and after to an "industrial settlement" is equivalent, in effect, to saying to each patient: "We will first remove your right arm, which interferes with your recovery, and then, after the wound has healed, educate you to become self-supporting and independent by giving you a pension and work suitable for a one-armed man." From this view-point the plan just considered is little short of wicked. I am, Sir, yours faithfully,

New York, June 12th, 1920. JOHN F. RUSSELL, M.D.

To the Editor of THE LANCET.

SIR,—We are glad to have an early opportunity of correcting what appears to be a misapprehension on Dr. John Russell's part as to what is being done at Papworth. Apparently he does not recognise that what we wrote was the outcome of practical experience and that we are describing an industrial settlement not

built on the basis of a *château en Espagne;* the industries are already started and some practical conclusions are actually reached.

We were dealing, in our note, with the principles that underlie a large commercial undertaking in which the industries are run entirely for the benefit of consumptive working men, of whom 100 are already at work, and in connexion with which a considerable sum of money is passing through the hands of the business manager (a consumptive), the accounts being controlled and audited by an official auditor. This industrial colony is managed by and for consumptives, run on sound business lines and principles, in which consumptives in the colony village earn a full rate of wages for the number of hours they work, whilst others are being trained to follow in their footsteps. The turnover for these industries runs into five figures annually. In a booklet recently published we have anticipated the criticism contained in the first paragraph of Dr. Russell's letter:—

"Already the industries have a yearly turnover of many thousands of pounds. Serious work must be put in by all those employed; life is again given that zest which is all the more real and stimulating because it is triumphing over unfavourable circumstances. We compete in the ordinary markets with our goods. There is no undercutting, but, as manufacturers of articles for the wholesale trade, we fall into line with those who produce goods in the ordinary commercial way. To sum up, we might say that a colony takes and makes use of all that is good in industrial life, whilst rejecting or altering much that is detrimental to the welfare of the consumptive worker."[1]

Whether this is "visionary and extravagant," and whether the "commercial principle of supply and demand is wholly ignored," your readers will be able to judge.

As regards Dr. Russell's reference to pensions, we look upon them as "earned," and we maintain that in the case of consumptives they should be continued not as a gift or a dole, but as a right—as something awarded to a damaged man without which he is unable to continue on the level at which he was working and living before he entered the war. If Dr. Russell will come and look at the Papworth Colony (or make inquiries from some of his fellow-countrymen who have already visited the colony) he will find that it is possible to put into practice the plan concerning which he has such doubts; that it is neither visionary nor extravagant; and that it does not pauperise the worker. It is not a question of "if it were found possible"; the scheme is an accomplished fact, a striking success.

We are glad to know that such good results are being achieved at the Thompson Street Rooms, and we wish Dr. Russell all success in his efforts, for if proper provision cannot be made for consumptive wage-earners it is well that they should be educated, advised, and controlled; but whatever may be done with them in the workaday world they will always be tempted to overwork, and must remain more or less active centres of infection to those who work and live with them.

Finally, we cannot agree that taking a man to a sanatorium deprives him of his right arm, but we do realise that such a patient has indeed already been damaged, so far as capacity to engage in many industrial occupations is concerned, far more than by the loss of that right arm.

As to the last line of Dr. Russell's otherwise moderate letter, we should like to ask him whether it is more *wicked* to help a man to live a decent life and to keep his family with the aid of a pension than it is to leave that man in the surroundings in which he has contracted or laid the foundation of the disease, knowing the chances are that, although he may continue to work, he is all along fighting against long odds, and, whilst losing ground, must continue to be a centre of infection to his family and his fellows. We leave that to your readers to determine.—We are, Sir, yours faithfully,

P. C. VARRIER-JONES.
G. SIMS WOODHEAD.

Cambridge, July 24th, 1920.

*** It seemed right to give those who were so strongly accused an immediate chance of reply.—ED. L.

[1] Industrial Colonies and Village Settlements for the Consumptive, p. 112. Cambridge University Press. London. 1920.

SKIN AFFECTIONS AND GENERAL SYMPTOMATOLOGY.

To the Editor of THE LANCET.

SIR,—Your short reference to a paper read by Mr. Mollinson at the meeting of the British Medical Association at Cambridge, in which he says that septic conditions of the tonsils may be a source of various skin affections, such as psoriasis, touches the fringe of a large subject. Recently a child in good position, well cared for in all respects, was brought to me on account of psoriasis, which was rebellious to treatment. I found septic tonsils, and after these were removed the patient was cured.

But the pathology of psoriasis is practically unknown. Consequently the practitioner is debarred from frontal attack, and must ascertain in what way his patient, as a whole, departs from the normal. I believe it was Hebra who said that "psoriasis is a disease of the healthy." My own experience has taught me that if we can only investigate sufficiently, each victim of psoriasis will reveal some degree of pathologic deviation, which must be rectified before we can cure the disease. A large number of sufferers from psoriasis are chronically constipated. It is remarkable how many of these people are cured by the internal administration of petroleum, *provided the petroleum cures the constipation.* A Lane-Curtis belt is frequently a great help in bringing about this happy result.

Psoriasis is, of course, not the only affection of the skin that is profoundly influenced by a toxic state of the blood. In investigating any eruption, except those caused by known definite agents such as scabies and tinea, the first thing to do is to seek for any cause which may give rise to general systemic infection. The rôle played by carious teeth and pyorrhœa in increasing the vulnerability of the skin can scarcely be over-rated, and in dermatological practice it should be part of the routine to examine carefully the buccal cavity. In innumerable instances obstinate skin affections have been cured by the intelligent treatment of the patient when classic methods of fighting the disease have failed.

I am, Sir, yours faithfully,

Birmingham, July 26th, 1920. ARTHUR LOXTON.

THE INVESTIGATION OF RENAL EFFICIENCY.

To the Editor of THE LANCET.

SIR,—While we agree with Dr. Harrington Sainsbury that the body does fortunately possess to some extent the power of compensating for disease of a particular organ or system, we are of opinion that careful study of the diseased organ offers the most fruitful prospect towards successful diagnosis, prognosis, and treatment. The utilisation of other resources of the body has long been recognised, and any advance in the knowledge of such mechanisms cannot fail to be of value. Unfortunately, these extra resources are often of minor importance; indeed, it is doubtful whether certain functions of the renal system are at all exercised by other organs.

We would point out, however, that such a test as the estimation of blood urea affords an index, not only of the efficiency of the kidney, but also of the general power of the body to eliminate urea.

With regard to Dr. E. W. Dewey's questions: (1) We have not tried urea in the treatment of cardiac œdema, but its diuretic properties might very possibly be of use in this connexion in certain cases. (2) A salt-free diet, or at any rate a very sparing use of salt, should be advantageous on theoretical grounds, and in practice we have several times found that the combination of urea and a practically salt-free diet gave good results, in difficult cases. (3) We have not seen any instance of uræmia being precipitated in interstitial nephritis by the administration of urea, nor do we think this contingency at all likely to arise. In the first place, it is very doubtful whether urea *per se* takes any part in the development of uræmia; and secondly, in an advanced case, in which the possibility of uræmia might have to be taken into consideration, the retention of urea in the

blood is generally so great that its concentration would, relatively speaking, be only very slightly increased by a dose of 15 g. of urea administered by the mouth. From a large experience we are convinced that no danger exists in this direction.—We are, Sir, yours faithfully,

H. MACLEAN,
A. E. RUSSELL.

St. Thomas's Hospital, S.E., July 26th, 1920.

THE TUBED PEDICLE IN PLASTIC SURGERY.

To the Editor of THE LANCET.

SIR,—In various medical papers Major H. D. Gillies lays great importance to the discovery of the tubed pedicle. He claims in the *Journal of Surgery, Gynæcology, and Obstetrics*, February, 1920, to use his own words, "that he propounded the method in September, 1917."

If you, Sir, will refer to your issue of Dec. 15th, 1917, p. 889, you will see that in conjunction with the then Lieutenant G. S. Hett, on Nov. 12th, I performed the second stage of the operation, which consisted in sewing a chest pedicle together. This case is illustrated on p. 891. I distinctly recollect telling Major Gillies why I took this step, and have no recollection of his having done a similar operation previously.

I would draw Major Gillies' attention to the history of the double pedicle flaps to which he attaches so much importance. The first double pedicle flap at Sidcup was performed upon a man for deficient lower eyelid by myself. I transferred a stirrup flap from above to below the eye. Subsequently we found that Tripier had previously done a similar operation. I next made a large double pedicle flap from the throat and slipped it over the chin to make a lower lip in a man named McCrea. Major Gillies next did a converse operation, bringing down the scalp to the chin, and subsequently brought his chest flap up in a case of burn to the face. There are many who recollect this sequence of events, but the records are there for reference. In my work in the press, "Records of Plastic Surgery in Civil Life," I do not intend to enter into any disputes, but hope to depict the influence of war surgery on civil practice, leaving out all war cases and much of the pettiness connected with them. I am quite certain my late colleague will admit my contention in this letter once his attention is drawn to the same.

I am, Sir, yours faithfully,
J. L. AYMARD,
Late Plastic Surgeon, Cambridge Hospital, Aldershot, and Queen's Hospital, Sidcup.

Globe House, St. George's-street, Capetown, July 1st, 1920.

MEDICAL EXPERIENCES IN MACEDONIA AND THE CAUCASUS.

To the Editor of THE LANCET.

SIR,—I am glad to find myself in full agreement with Professor L. S. Dudgeon's conclusions, as stated in his letter appearing in your issue of July 17th, that intramuscular injections of quinine may be regarded without apprehension provided it be recognised that serious troubles may arise unless the dangers, and how to avoid them, are fully understood. It would, indeed, have been surprising had we differed, seeing that the actual cases from which Professor Dudgeon's conclusions were drawn were for the most part the same that came under my own observation. Nearly all the ill-effects of intramuscular injections observed by Professor Dudgeon and enumerated by him in his article in the *Journal of Hygiene* were assignable to some error in technique and come under the category of preventable complications.

Considering the many thousands of injections given in Macedonia, the very small number of cases in which such ill-effects followed is a testimony, as Professor Dudgeon observes, to the recuperative power of the tissues; it also goes far to prove the point for which I was contending, that those who employed this method of treatment were alive to the risks, and with rare exceptions were successful in the precautions they took to prevent complications.

I am, Sir, yours faithfully,
A. G. PHEAR.

Weymouth-street, W., July 19th, 1920.

The Services.

ROYAL ARMY MEDICAL CORPS.

Majors to be acting Lieutenant-Colonels: H. T. Wilson, R. N. Hunt.

To be Captains: Temp. Major J. H. Spencer; Capts. W. E. K. Coles (late R.A.M.C.), E. O. A. Singer (from Spec. Res.).

L. Handy and J. W. Malcolm, late R.A.M.C., Spec. Res., to be temporary Captains.

Temp. Lieut. J. F. P. Gallagher to be Lieutenant.

B. McB. Richardson to be temporary Honorary Lieutenant.

Officers relinquishing their commissions:—Temp. Major A. L. B. Green (retains the rank of Major); Temp. Capt. S. Stockman (granted the rank of Major); Temporary Captains retaining the rank of Captain: I. M. Grant, J. M. Mitchell, H. R. S. Walford, A. McK. Bell, C. Stanley-Clarke, W. B. U. Patterson, A. P. Adams, P. E. B. Barrow, S. H. Pitcairn, A. M. Masters, J. D. Judson, S. D. Craig; Temp. Hon. Capt. B. M. Richardson (retains the honorary rank of Captain).

Capt. W. N. Greer, R.A.M.C. (S.R.), and Temp. Capt. D. V. O'Malley, R.A.M.C., have been appointed Officers of the Military Division of the Most Excellent Order of the British Empire for valuable services rendered in connexion with military operations in Burma.

TERRITORIAL FORCE.

Lieut.-Col. C. I. Ellis to be Deputy Assistant Director of Medical Services, Wessex Division, with the pay and allowances of a Major.

Capt. L. T. Challenor to be Deputy Assistant Director of Medical Services, South Midland Division.

Lieut.-Col. A. G. Hamilton to command 4th Cheshire Cavalry Field Ambulance.

Majors to be Lieutenant-Colonels and to command as stated: A. E. Jerman (4th London Field Ambulance), A. A. W. Merrick (3rd West Lancs. Field Ambulance), T. Kay (2nd Scottish Casualty Clearing Station), E. C. Stack (6th Stafford Cavalry Field Ambulance), F. W. Bailey (1st West Lancs. Field Ambulance), J. G. Martin (2nd West Lancs. Field Ambulance), W. Archibald (2nd Eastern Casualty Clearing Station), C. R. White (3rd Western Casualty Clearing Station).

Surg.-Major C. O. Parsons, from R.G.A., to be Lieutenant-Colonel and to command 2nd Welsh Field Ambulance.

Captains to be Lieutenant-Colonels and to command as stated: H. F. W. Boeddicker (1st Southern Casualty Clearing Station), F. Darlow (2nd Northern Casualty Clearing Station), G. L. Thornton (1st Wessex Field Ambulance), F. A. Roper (2nd Southern Casualty Clearing Station), H. F. Everett (1st East Anglian Field Ambulance), T. B. Wolstenholme (2nd Western Casualty Clearing Station).

Major L. C. V. Hardwicke to be acting Lieutenant-Colonel whilst specially employed.

Majors T. D. Brown and D. R. Dobie resign their commissions and retain the rank of Major.

Capt. P. W. G. Sargent resigns his commission and is granted the rank of Colonel.

Capts. F. J. M. Kennedy and D. M. Marr resign their commissions and retain the rank of Captain.

Capts. J. Barkley and J. R. Menzies to be Majors.

Capt. A. G. Wilson, from 3rd Northern General Hospital, to be Captain.

TERRITORIAL FORCE RESERVE.

Major H. Richardson, from R.A.M.C. (General List), to be Colonel; Capt. C. W. Eames, from General List, to be Lieutenant-Colonel; Capt. C. N. Smith, from General List, to be Major.

Capt. K. S. Storrs resigns his commission and retains the rank of Captain.

ROYAL AIR FORCE.

The undermentioned have been granted permanent commissions, subject to physical fitness and to acceptance of conditions of service when promulgated:—

Wing Commanders: H. V. Wells, C. E. C. Stanford, A. W. Iredell, H. Cooper, A. V. J. Richardson, J. McIntyre, M. W. Flack.

Squadron Leaders: H. M. S. Turner, E. C. Clements, W. W. Shorten, W. A. S. Duck, B. A. Playne, R. H. Knowles, H. A. Treadgold, J. MacGregor, H. A. Hewat, H. B. Porteous, T. S. Rippon, F. N. B. Smartt, H. E. Whittingham, D. Ranken.

Flight Lieutenants: A. S. Glynn, A. E. Panter, H. W. Scott, P. M. Keane, T. J. Kelly, R. S. Overton, D'Arcy Power, J. Rothwell, K. Biggs, A. J. O. Wigmore, J. H. Porter, A. F. Rook, T. C. St. C. Morton, G. S. Marshall, E. W. Craig, R. A. G. Elliott, T. J. Thomas, P. H. Young, R. S. Topham, T. R. S. Thompson, P. C. Livingston, P. J. Flood, J. T. T. Forbes, J. Kyle, C. T. O'Neill.

The following promotions are made:—

Squadron Leaders to be Wing Commanders: H. M. S. Turner, E. C. Clements.

Flight Lieutenants to be Squadron Leaders: A. S. Glynn, A. E. Panter, H. W. Scott, P. M. Keane.

The undermentioned are granted short service commissions, subject to physical fitness and to acceptance of conditions of service when promulgated:—

Squadron Leaders (whilst so employed): R. L. Roe, H. Harvey, F. C. Jobson.

Flight Lieutenants: E. P. Punch, E. N. H. Gray, R. E. Bell, C. H. B. Thompson, E. A. Lumley, D. G. Boddie, R. J. Aherne, W. F. Wilson, F. J. P. Saunders, W. A. Malone, F. J. Murphy, H. McW. Daniel, A. E. Barr-Sim, P. A. Hall, H. B. Troup, R. Mugliston, J. C. Smyth, J. P. Hosford, J. J. O'Mullane, J. P. Wells, T. Montgomery, A. Briscoe, E. G. O'Gorman, T. J. X. Canton, W. F. Shiel, A. Watson, C. H. Young.

Flight Lieut. F. J. P. Saunders is seconded for duty with the Director of Research.

The following officers are granted short service commissions in the ranks stated:—
Flight Lieutenant: E. P. Hardman.
Flying Officers: J. B. Allen, V. P. Feather, J. Talbot.
Observer Officer: W. W. Bradford.
Flying Officer S. G. Frogley resigns his short service commission and is granted the rank of Flight Lieutenant.

TERRITORIAL DECORATION.

The Territorial Decoration has been conferred upon the undermentioned officers: Lieut.-Cols. J. W. Leitch (1st Lowland Field Ambulance), M. Dunning (2nd Lowland Field Ambulance); Majors G. W. Fitzgerald (1st East Lancs. Field Ambulance), A. W. French (3rd London (City of London) Field Ambulance), W. G. Sutcliffe (attached 3rd Home Counties Brigade, R.F.A.), J. Leach (Highland Mounted Brigade Field Ambulance), H. G. F. Dawson (attached Welsh Divisional Engineers), B. Riddell (3rd Scottish General Hospital); Capt. L. B. Cane (attached Inns of Court O.T.C.).

FOREIGN DECORATIONS.

French.

Médaille des Épidémies "d'Or."—Maj. G. H. J. Brown, D.S.O., R.A.M.C.; Capt. H. Lightstone, D.S.O., M.C., R.A.M.C. (T.F.).
Médaille des Épidémies "en Argent."—Maj. G. P. A. Bracken, R.A.M.C.; temp. Capt. J. F. Broughton, M.C., R.A.M.C.; Capt. D. Mackie, M.C., R.A.M.C. (S.R.); Capt. C. J. L. Patch, M.C., I.M.S.; temp. Capt. A. G. Whitehorne-Cole, R.A.M.C.; temp. Capt. A. W. Young, M.C., R.A.M.C.
Médaille des Épidémies "en Bronze."—Temp. Lt. W. S. Baird, R.A.M.C.; temp. Capt. H. R. Dew, R.A.M.C.; temp. Capt. J. E. Paterson, R.A.M.C.

Serbian.

Order of St. Sava: 4th Class.—Maj. G. Ashton, T.D., R.A.M.C. (T.F.); temp. Capt. P. Black, R.A.M.C.

URBAN VITAL STATISTICS.

(Week ended July 24th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·9 in each of the three preceding weeks, fell to 9·8 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·1, or 1·0 per 1000 below that recorded in the previous week, while among the remaining towns the rates ranged from 1·8 in Cambridge, 4·4 in Preston, and 4·9 in Wallasey and in Dewsbury, to 17·0 in Enfield, 17·1 in Tynemouth, and 17·7 in Great Yarmouth. The principal epidemic diseases caused 192 deaths, which corresponded to an annual rate of 0·6 per 1000, and comprised 91 from infantile diarrhœa, 42 from diphtheria, 29 from measles, 20 from whooping-cough, 7 from scarlet fever, and 3 from enteric fever. Measles caused a death-rate of 1·2 in Rhondda and 1·4 in Warrington, but the mortality from the remaining diseases showed no marked excess in any of the towns. There were 1911 cases of scarlet fever and 1556 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1855 and 1582 respectively at the end of the previous week. The causes of 27 of the 3342 deaths in the 96 towns were uncertified, of which 5 were registered in Birmingham.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 11·1, 12·1, and 11·1 in the three preceding weeks, rose to 11·6 per 1000. The 274 deaths in Glasgow corresponded to an annual rate of 12·8 per 1000, and included 11 from infantile diarrhœa, 9 from small-pox, 2 each from measles and diphtheria, and 1 each from enteric fever and whooping-cough. The 87 deaths in Edinburgh were equal to a rate of 13·3 per 1000, and included 2 from infantile diarrhœa and 1 from diphtheria.

Irish Towns.—The 102 deaths in Dublin corresponded to an annual rate of 12·8, or 2·9 per 1000 below that recorded in the previous week, and included 3 from whooping-cough, and 1 each from measles and infantile diarrhœa. The 92 deaths in Belfast were equal to a rate of 11·6 per 1000, and included 3 from infantile diarrhœa, 2 from diphtheria, and 1 each from scarlet fever and whooping-cough.

TYRONE COUNTY INFIRMARY.—At a meeting of the Co. Tyrone Hospital Committee, held in Omagh on July 10th, it was stated the deficit for the present year was estimated as being about £2500, but as the accounts had not yet been audited the county council could not be asked to meet this deficit. The effort to raise £700 of debt (which cannot be recouped by the county council) was reported as proceeding satisfactorily; and when this sum is found the Committee will get £900 from the Red Cross Society. The amount of the £700 already received is £400. It was agreed to increase the salary of the nursing sisters to £70 per annum, the officers to get an increase of 15 per cent. on their present salaries, and the servants and the nurses to receive an addition of 25 per cent.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Care of the Blind.

THE Bill introduced by Dr. ADDISON, Minister of Health, to promote the welfare of blind persons in the United Kingdom, was considered by a Standing Committee of the House of Commons on Thursday, July 22nd, Sir WATSON RUTHERFORD in the chair.

On Clause 1, in answer to criticisms to the effect that the Bill did not go far enough, Dr. ADDISON pointed out that over 50 per cent. of the blind would be automatically included within the operation of this clause, and of the remainder one-third were children under 16 years of age. Under Clause 2, if amended as he would propose later, it would be the duty of county and county borough councils, instead of being optional as originally contemplated, to make provisions for the maintenance and training of all blind persons. The Government proposed that 50 per cent. of all capital expenditure of those authorities in regard to the provision of workshops and so forth should be provided by Exchequer grants. In addition they would continue grants in respect of training, and would make maintenance grants to institutions in respect of persons trained. He thought that it was better to proceed in this way than by granting pensions in a wholesale manner. On a division Clause 1 was agreed to by 16 votes to 9, and Dr. ADDISON then moved the new subsection to Clause 2, to which he had previously referred. The subsection was agreed to. A further amendment proposed by Dr. ADDISON requiring that local authorities should make suitable provision for the technical education of blind persons was also adopted. The Committee stage of the Bill was concluded, and the measure as amended was ordered to be reported to the House.

Dangerous Drugs Bill.

The Dangerous Drugs Bill, a measure prepared to give effect to the International Opium Convention signed at the Hague in 1912, was considered by a Standing Committee of the House of Commons on Tuesday, July 27th. Colonel W. G. NICHOLSON was in the chair.

Sir J. BAIRD, Under Secretary for Home Affairs, moved an amendment to Clause 7 which deals with the control of the manufacture or sale of cocaine, morphine, and other drugs, providing that regulations under the section should provide for authorising any person who lawfully kept a shop for retailing poisons under the Pharmacy Act, 1868, as amended by the Poisons and Pharmacy Act, 1908, (*a*) to manufacture at the shop in the ordinary course of his retail business any preparation, admixture, or extract of any drug to which Part 2 of the Act applies, or (*b*) to carry on at the shop the business of retailing, dispensing, or compounding any such drug, subject to the power of the Secretary of State to withdraw the authorisation in the case of a person convicted of an offence against the Act or of an offence under the enactments relating to the customs as applied by the Act, and who could not in the opinion of the Secretary of State properly be allowed to carry on the business of manufacturing or selling or distributing any such drug. The Secretary of State, before withdrawing the authorisation, is bound to consult the Council of the Pharmaceutical Society of Great Britain. Nothing in any regulations made under the section is to be taken to authorise the sale or keeping of an open shop for the retailing, dispensing, or compounding of poisons by any person who is not qualified under the provisions of the Pharmacy Acts or to be in derogation of the provisions of those Acts for prohibiting, restricting, or regulating the sale of poisons. The amendment was agreed to.

Sir J. BAIRD moved an amendment to Clause 13, which deals with offences and penalties, to the effect that a person guilty of an offence under the Act should be liable on summary conviction to both fine and imprisonment and in the case of a second or subsequent conviction to a fine not exceeding £500, or to imprisonment with or without hard labour for a term not exceeding two years, or to both such fine and imprisonment, and the court dealing with the case may, in addition to any other punishment, order the goods in respect of which the offence was committed to be forfeited. The amendment was agreed to.

Sir J. BAIRD moved another amendment to Clause 13, providing that any proceedings for an offence against the Act before a court of summary jurisdiction might, notwithstanding any enactment prescribing the time within which such proceedings might be brought, be brought either within the time so prescribed or within three months from the date on which evidence sufficient in the opinion of a Secretary of State to justify a prosecution for the offence came to his knowledge, whichever was the longer, and a certificate purporting to be signed by the Secretary of State as to the date on which such evidence came to his knowledge should be

conclusive evidence thereof. In the application of the subsection to Scotland the Lord Advocate, and in its application to Ireland the Attorney-General for Ireland, should be substituted for a Secretary for State. The amendment was agreed to.

Sir J. BAIRD moved a new clause providing that any constable might arrest without warrant any person who had committed or attempted to commit, or was reasonably suspected by the constable of having committed or attempted to commit, an offence against the Act, if he had reasonable ground for believing that that person would abscond unless arrested, or if the name and address of that person were unknown to and could not be ascertained by him. The clause was agreed to.

On the motion of the Attorney General for Ireland (Mr. HENRY), a new clause was agreed to to the effect that in the application of the Act to Ireland (*a*) a reference to The Poisons (Ireland) Act, 1870, The Pharmacy (Ireland) Act, 1875, and The Pharmacy (Ireland) Act, 1875 (Amendment) Act, 1890, should be substituted for any reference to The Pharmacy Act, 1868; and (*b*) a reference to the Pharmaceutical Society of Ireland should be substituted for the reference to the Pharmaceutical Society of Great Britain. The clause was agreed to.

The Committee stage of the Bill was concluded and the Bill was ordered to be reported to the House.

HOUSE OF COMMONS.

WEDNESDAY, JULY 21ST.

Report of Birth-rate Commission.

Lieutenant-Colonel FREMANTLE asked the Minister of Health if he had considered the Second Report of the Birth-rate Commission; and what steps he proposed to take to secure constant consideration in future of the practical problems involved.—Dr. ADDISON replied: I have seen the Report in question. All statistical aspects of the matter are kept under continuous review by the Registrar-General's Department, now working in close relation to the Ministry. Any steps that are desirable and practicable will be taken, but I am not clear as to any special action by the Ministry that is called for at the present time.

Venereal Diseases Officer at Bury.

Captain LOSEBY asked the Minister of Health whether the position of venereal diseases officer at Bury, Lancashire, a part-time appointment of nearly £350 a year, had been given to an applicant who did not join up for service in the war; whether 15 applications were received; whether the three selected for interview possessed at least equal academic status and experience to the one chosen for the position; whether these three applicants had each been over four years in the army and had served overseas; whether, seeing that, other qualifications being equal, an important public post, paid for out of Government funds, should be given to a man who had served in the Forces, and the appointment must be ratified by the Ministry of Health, what action he proposed to take in the matter.—Dr. ADDISON replied: I have not yet received any application for approval of this appointment, but I am communicating with the Bury town council in the matter.

Association of British Girls with Orientals.

Brigadier-General SURTEES asked the Secretary for the Home Department whether his attention had been called to the state of things existing in the East-end of London, as well as in a number of seaport towns, in consequence of the association of young British girls with Chinamen, negroes, Indians, and others of Oriental race, an association often leading to rioting and other evils; and what steps, if any, he intended to take in the matter.—Mr. SHORTT replied: I am aware that last year some disturbances arising from this cause occurred at Cardiff and other seaports, but no serious trouble of a similar character has come to my notice during the present year; and I find on inquiry that in East London there has only been one incident worth mentioning, when several arrests were made. If there should be any further trouble of this sort the police will deal with it as they would deal with any other disturbance of the peace.

Disabled Men's Complaint at Woolwich.

Mr. L'ESTRANGE MALONE asked the Minister of Labour whether his attention had been called to the fact that many disabled ex-Service men at Woolwich were being deliberately given work which aggravated their disabilities or which their disabilities prevented them from doing efficiently; and would he send an independent investigator to examine the evidence on this subject which was in the possession of the Woolwich branch of the National Union of Ex-Service Men.—Dr. MACNAMARA replied: My attention has not been called to any cases of this kind, but if particulars are supplied to me I shall be glad to make inquiry. I cannot imagine that it is true that disabled men are deliberately given work which aggravates their disabilities

Officers and Nurses held up at Alexandria.

Lieutenant-Colonel WALTER GUINNESS asked the Secretary for War whether troops and nurses on their way home for demobilisation had been waiting in certain cases at Alexandria since the month of April; whether he could state what was the reason of the delay; and what steps were being taken to deal with it.—Sir A. WILLIAMSON (Financial Secretary to the War Office) replied: I have recently caused full inquiries to be made into the allegations that officers and nurses have been detained for long periods at Alexandria awaiting passages, and from the reports recently received it appears that, although there has been delay, it has been unavoidable. In a report received at the end of June it was stated that no officers or nurses had been awaiting passage for as long as three months, and only three officers had been awaiting passage for more than five weeks. On June 19th there were 127 officers in the camp altogether awaiting passage and 52 nurses, and a special ship was arranged for the transport of these. As regards other ranks I am informed that there has been no delay whatever in their embarkation from Egypt since May last, as the third-class accommodation available has more than met the requirements.

THURSDAY, JULY 22ND.

Neurasthenia Treatment in Ireland.

Sir ROBERT WOODS asked the Minister of Pensions if it was the case that for the three southern provinces of Ireland the only institution for the treatment of discharged soldiers suffering from neurasthenia was Leopardstown Park, county Dublin; if the accommodation was limited to 35 patients; if there were at present awaiting admission there 248 men for whom treatment in that place had been recommended; and, if so, what steps he proposed to take to provide adequate accommodation for these distressing cases.—Mr. MACPHERSON replied: The facts are substantially stated in the question. Arrangements are, however, in progress to provide accommodation at Leopardstown Park for an additional 50 patients, and the question of providing further facilities for the treatment of this class of patient is engaging my earnest attention. I need scarcely remind my honourable friend that there are considerable local difficulties to be contended with, but I can assure him that everything possible will be done to meet the situation.

Deaths of War Pensioners.

Mr. TYSON WILSON asked the Minister of Pensions if he would give the number of persons who, having been granted pensions owing to injuries or disease caused by the late war, had died since the pension was granted them.—Mr. MACPHERSON replied: The approximate number of officers is 800 and of other ranks 30,000.

Pension Curtailments and the Medical Boards.

Captain BOWYER asked the Minister of Pensions whether he was aware that numerous cases of complaint had arisen with regard to the cutting down of the pensions of disabled soldiers irrespective of, and without apparent reference to, the awards of medical boards; would he state on what principle such pensions were cut down; and would he undertake that in future where the disability remained constant or increased that the pension should also either remain constant or be increased proportionately to the increased disability.—Mr. MACPHERSON replied: I am not aware of the numerous cases of complaint suggested in the question. All awards of pension under the Royal Warrant are in accordance with the findings of the medical boards by whom the pensioners are examined and no alteration is made in a board's original estimate of the degree of a man's disablement without further reference to the board, or the authority of a superior board after a fresh examination of the man. The present practice is, in fact, in accordance with the suggestion made in the last part of my honourable and gallant friend's question.

FRIDAY, JULY 23RD.

Experiments on Living Animals.

Sir J. BAIRD moved an address for a "return showing the number of experiments on living animals during the year 1919 under license granted under Act 39 and 40 Vict. Cap. 77 distinguishing the nature of the experiments."

MONDAY, JULY 26TH.

National Registration Acts.

Sir BURTON CHADWICK asked the Minister of Health if he would state what was the present position of the scheme of national registration; whether it was being kept up to date; for what purpose; and at what cost.—Dr. ADDISON replied: The National Registration Acts legally remain in operation until the official termination of the war. The answer to the second question is in the negative and the remaining questions do not arise.

Medical Examinations for Service Pensions.

Sir WATSON RUTHERFORD asked the Minister of Pensions whether a man who applied for a service pension was to be subjected to a fresh medical examination; and whether there were numerous cases where the service pension now granted was accompanied by such a reduction of the disability pension that both put together did not exceed the total amount formerly drawn on the disability alone.—Mr. MACPHERSON replied: The regulations regarding "service" pensions in addition to disablement pensions vary according to the length and nature of the man's service, and I regret that it is not therefore possible to give a comprehensive answer to this question. If my honourable friend has any specific cases in mind I shall be glad to give him full information on receiving the regimental particulars.

Medical Men at the Ministry of Health.

Sir J. D. REES asked the Minister of Health whether 32 doctors at £1000 a year were now to be appointed to work under his direction.—Dr. ADDISON replied: Yes, Sir. They are appointed to act as referee consultants under the National Health Insurance Scheme, with the object of protecting insurance funds from unnecessary claims to sickness benefit and improving the general standard of insurance medical practice. Funds for this purpose were voted by Parliament in 1914, but not spent during the war, owing to the impossibility of establishing this much needed extension of the Health Insurance Medical Service during that time.

TUESDAY, JULY 27TH.

Alleged Maggoty Flour at Macclesfield.

Mr. REMER asked the Food Controller whether his attention had been called to a statement by Councillor Webster, of Macclesfield, that a quantity of flour had been stored at the Beehive Mill, Bollington, since the early part of the war; that this flour was maggoty and unfit for human food; that the Ministry of Food had issued instructions that this flour should be sold locally owing to the cost of transport; and that a large quantity was at the present moment being sold to bakers in the borough of Macclesfield; whether these facts were correct; if so, whether he would take steps to prevent the distribution of food unfit for human food; and, if the statement was incorrect, whether he would cause the statement to be denied.—Mr. MCCURDY replied: My attention has been called to the statement in question, which is untrue in every particular. There is no ground whatever for this aspersion upon the conduct of the efficient officers whose duty it is to inspect at regular monthly intervals the stocks of flour belonging to the Royal Commission on Wheat Supplies lying at warehouses and mills.

Health of the Troops in Mesopotamia.

Mr. LAMBERT asked the Secretary for War if the health of the British troops in Mesopotamia was satisfactory, and if he could state the ratio of sickness among the forces in Mesopotamia as compared with those in the United Kingdom.—Mr. CHURCHILL replied: For the first three months of this year the health of the British troops in Mesopotamia was very satisfactory, the sick-rate being less than that in the United Kingdom. In April, the last month for which complete figures are available, the admission-rate per 1000 of strength rose owing to the seasonal incidence of sandfly fever, giving an annual ratio of 890·4 per 1000, compared with 644·6 per 1000 in the United Kingdom. The incidence of sandfly fever increased during May and June, but is now declining rapidly.

Welfare Work in Factories.

Sir BURTON CHADWICK asked the Minister of Health if he would state what steps were taken to maintain and stimulate the welfare work in factories initiated during the war.—Mr. SHORTT (Home Secretary) replied: The Home Office obtained statutory powers in 1916 to make Orders requiring the provision of welfare arrangements in factories, and a number of such Orders have been made for different classes of works dealing with the provision of mess-rooms and cloak-rooms, washing facilities, first-aid and ambulances, and other matters. The factory inspectors enforce these orders, and it is also part of their ordinary routine when visiting works to investigate the welfare conditions and to promote the development of welfare work. The Home Office has also endeavoured to assist and stimulate voluntary action on the part of employers. A series of official pamphlets has been issued explaining the principles on which welfare work is based and dealing with it in detail in its different aspects. Conferences have been held with representatives of the Universities, of employers and workpeople, of welfare workers and others on the important question of the selection and training of welfare workers, and generally on the development of welfare work. When opportunity has offered the subject has also been pressed on the attention of the Joint Industrial Councils. I am glad to state that the reports of the factory inspectors show that a widespread and increasing interest is being taken in this work and that steady progress is being made in the introduction and improvement of welfare arrangements.

Decisions of Medical Appeal Tribunals.

Mr. CHARLES EDWARDS asked the Minister of Pensions if he was aware that great dissatisfaction existed among ex-Service men through the decisions of the medical appeal tribunals, which deprived them of any further pensions notwithstanding the fact that many of these men were now unable to do the same work as before and were only able to do work of a less arduous nature at much lower wages than their former employment would now bring them in; whether many were discharged as totally unfit for further service, yet the result of the appeal tribunal was the same; if he would state how these tribunals were appointed; whether they were permanently employed by the Ministry; and what instructions were given them with reference to these examinations; and whether he would set up another tribunal with power to fully investigate the former condition of these men as regards health, for comparison purposes when the final examination was being made, and thus endeavour to give the greatest possible satisfaction to men who had so strong a claim upon the nation.—Mr. MACPHERSON replied: I am not aware of any grounds for thinking that the arrangements for appeal to medical appeal boards, to which presumably my honourable friend refers, are working otherwise than satisfactorily. These boards were constituted to give both disabled men and the Ministry the advantage of the advice of specialists in the various diseases of disability, and a specialist is always a member of an appeal board. Members are appointed by the Minister, and apart from the Deputy Commissioner of Medical Services of the area, who is a whole-time officer, they are remunerated on the basis of a fee per session. None of the members are in the permanent employ of the Ministry. No special instructions have been given to the appeal boards which would interfere with their unfetterred judgment on the merits of each case that comes before them, and, in the circumstances, I see no advantage in constituting a new tribunal as suggested by my honourable friend. With regard to the ground of complaint alleged, I would remind my honourable friend that the accepted basis of the award of disablement pension is the medical estimate of the extent of the disablement consequent upon the disability which has been found to be due to the man's war service. Considerations as to the wages which a pensioner is capable of earning (which under the present system are expressely excluded from the assessment of pension) could not reasonably be introduced in those cases only where they would be to the man's advantage.

Imports and Exports of Extract of Male Fern.

Mr. WILLIAM GRAHAM asked the President of the Board of Trade whether he could state the exports and imports in the year 1913 of the extract of male fern technically described as ext. filicis liq. or ext. filicis maris, and what were the returns of export and import for the first six months of the present year, or for such post-war period as might be available; and whether such exports and imports were subject to any special arrangements giving preference to the products of any country.—Mr. BRIDGEMAN (Parliamentary Secretary to the Board of Trade) replied: In the year 1913 the value of the imports into the United Kingdom of extract of male fern was £739. I am unable to state the total value of the exports of this commodity during that year, or of either imports or exports during any post-war period, and I do not feel justified in having such particulars compiled, in view of the considerable expenditure of time which would be involved in the process. Extract of male fern is not dutiable, and no question of preference on the importation of the extract arises, but when it is imported dissolved in dutiable spirit preference is accorded on the dutiable ingredient if the latter is of Empire origin. No preference is given on the export of any goods.

Vaccination and the Glasgow Small-pox Outbreak.

Mr. ROBERT YOUNG asked the Secretary for Scotland, in reference to the Glasgow small-pox outbreak, whether any of the small-pox cases or deaths given in the return to July 12th, 1920, as unvaccinated had been vaccinated at any time either before the development of the disease or during the course of the disease; and, if so, would he give particulars.—Mr. MUNRO replied: In the return mentioned the classification of "unvaccinated" and "vaccinated" is determined by the condition at the date of exposure to infection. Of the 88 cases included under the heading "unvaccinated" 15 were vaccinated between exposure to infection and the development of the disease, 14 successfully and 1 unsuccessfully. Of these 15 cases 2 died. One was a child aged 2 months, who had been successfully vaccinated, and the other was a child aged 6 years, who was unsuccessfully vaccinated four days before the disease developed.

Medical News.

UNIVERSITY OF SHEFFIELD.—The following students have passed the Third M.B., Ch.B. examination held recently:—

Edgar S. Clayton, Mary P. Gell, Ronald D. S. Inman, Richard T. Lee, Elsa F. Paige, Robert Platt (distinction in Pathology), and Percival H. Sharp.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on July 22nd the following gentlemen, having passed the requisite examinations, were admitted Fellows:—

Harold Benge Atlee, James Clark Bell, Frederick Cameron, Alexander Rae Campbell, Frederick Ernest Feildon, Joseph Anthony Ferriere, Trevor Gayer Fetherstonhaugh, Thomas Watson Hancock, Sydney Lawrence Harke, William Knox Irwin, George Brownlee Isdale, Hugh Hunter Jamieson, Colin King, James Tait M'Auslin, Anthony John M'Creadie, William Archibald Mein, Abdul-Chani Neguib Misbah, Duncan Metcalfe Morison, George Thomson Mowat, William Graham Oakeley, Guy Harcourt Peall, Hugh Noel Murray Puckle, Matthew Edward Robinson, Robert Joseph Silverton, Andrew Fulton Sinclair, Francis William Stone, Frans Karel Te Water, and Cecil Uren.

LONDON SCHOOL OF TROPICAL MEDICINE.—The following are the results of the examination held at the end of the sixty-third session (May to July, 1920):—

*T. J. D. Lane ("Duncan" medal), *R. Jamison (P.M.O., Swaziland), *Miss E. J. O'Driscoll, *F. E. Reynolds, M. D. Mackenzie, J. M. MacKay (West African Medical Service), R. B. Hawes, J. Glavina (Malta), J. Forrest (Major, I.M.S.), V. E. Critien (Malta), S. A. Eldaab, J. V. Holmes, G. C. R. Wilson (Tanganyika Territory), and J. H. Parry (Tanganyika Territory).

* With distinction.

CENTRAL MIDWIVES BOARD FOR IRELAND.—The Board held their first examination for midwives on July 8th and 9th simultaneously at the Royal College of Surgeons, Dublin, the Queen's University, Belfast, and University College, Cork. Dr. Trevor N. Smith, Dr. Reginald G. White, Dr. Gerald Tierney, Dr. J. M. Gilmor, Dr. J. D. Williamson, Dr. John McLeish, Dr. John Booth, and Dr. Walter Rahilly acted as examiners. Seventy-three candidates presented themselves for examination, of whom 62 passed. The next examination takes place in October.

Dr. Mary Baird, now school medical officer at Torquay, has been selected as assistant medical inspector of schools in Natal.

Messrs. Cassell and Co. announce the early appearance of a seventh edition of Hutchison and Rainy's "Clinical Methods," and a fifth edition of Mr. Comyns Berkeley's "Handbook of Midwifery."

MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE SOCIETY, LIMITED.—The first ordinary general meeting of the company will be held at Lincoln House, 300, High Holborn, London, W.C., on August 23rd, at 4.45 P.M.

Edwin Smith, M.D. Lond., barrister-at-law, deputy coroner for Westminster and South-West London and lecturer on forensic medicine at St. Thomas's Hospital, has been appointed coroner for the North-Eastern District of London.

OWING to present economic conditions the Council of the School Dentists' Society has decided to discontinue the printing of separate *Transactions* and to supply instead a copy of the *British Journal of Dental Science* to each of its members. Mr. A. E. Baker, the editor of the *Transactions*, will act as dental editor and deal with correspondence and papers relating to school dentistry.

AT a recent meeting at Plymouth of the South-western Centre of the Sanitary Inspectors Association Dr. A. B. Soltau, chairman of the Plymouth Public Health Committee, urged the importance of having milk graded in this country, and of making it impossible for any retailer or producer to send out for consumption milk which is bacteriologically contaminated.

Dr. James Miller, who has been appointed professor of pathology at Queen's University, Canada, graduated M.B. in 1899, saw service in South Africa with the Edinburgh and East of Scotland Hospital, and during the recent war was pathologist to the 2nd Scottish General Hospital. In 1902 he was appointed lecturer in bacteriology in the University of Birmingham, returning to Edinburgh in 1909 as lecturer in pathology and bacteriology to the School of Medicine of the Royal Colleges and to the Edinburgh School of Medicine for Women. For about ten years he has acted as pathologist at the Royal Infirmary and other Edinburgh hospitals.

BELFAST HOSPITALS BUSY.—In connexion with the disturbances in Belfast the hospitals have been busy with gun-shot rifle wounds, scalp injuries, and body contusions. At the Royal Victoria Hospital during last week-end about 25 cases were admitted with gun-shot wounds and 16 deaths occurred arising out of the riots.

A WELSH CHAIR OF TUBERCULOSIS.—On the occasion of the Royal visit to open the sanatoriums of the Welsh National Memorial Association at Langwyfan in North Wales and at Talgarth in South Wales, the announcement was made by the president, Major David Davies, that a chief medical officer would shortly be appointed, who would also be professor of tuberculosis in the Welsh National School of Medicine. The position, with 15 institutions containing over 1100 beds to direct, a staff of 24 medical officers, and a medical school developing entirely on the unit system, will be unique.

PRESENTATION TO DR. T. RIDLEY BAILEY, OF BILSTON.—The medical practitioners on the Staffordshire panel entertained Dr. T. Ridley Bailey, chairman of the County Panel and Local Medical Committees, to luncheon on July 23rd. The Mayor of Stafford, Dr. F. Milnes Blumer, presided. After luncheon Dr. Bailey was presented with a gold cigarette case and a cheque.

MICHELL CLARKE MEMORIAL FUND.—This fund, opened in 1918, to collect a sum to commemorate the services of the late Professor John Michell Clarke to the cause of medical education in Bristol, has reached a total at which it will be possible, after paying for the publication of a volume reprinting some of his published writings, to devote about £1000 to the endowment of a fund for the purchase of books and periodicals on clinical medicine for the Bristol Medical Library. Should any friends of Professor Michell Clarke still wish to add to this fund they should address contributions to Mr. James Rafter, Registrar, University of Bristol.

VETERINARY SURGEONS AND QUACKERY.—Mr. W. Scott, F.R.C.V.S., presiding at a meeting at Bristol of the recently formed Mid-West of England and South Wales Veterinary Association, said that quacks were thriving on the credulity of animal owners, using drugs of which they knew nothing upon their dumb patients, of whose structures they had no scientific knowledge. The loss to the animal owner and State through this malpractice must be colossal, and Government legislation was urgently demanded. Animals were protected from cruelty, but there was nothing done to protect them from quackery and maltreatment.

THE PLYMOUTH MEDICAL CHARITIES.—The Committees of the South Devon and East Cornwall Hospital and the Royal Albert Hospital have decided that in future, although necessitous cases will be treated free of charge, a minimum charge of half a guinea weekly will be charged for in-patient treatment, and a charge of 6*d*. for each attendance after the first, including accident cases. These fees have been rendered necessary owing to the financial position of the charities.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE.—On Saturday, July 24th, the Sir Alfred Jones laboratories of the Liverpool School of Tropical Medicine were formally opened by Lord Leverhulme. The proceedings were presided over by Sir Francis Dawson, chairman of the school, who stated in his introductory remarks that the laboratories had been built and equipped by funds placed at the disposal of the committee by the executors of the late Sir Alfred Jones—the founder and staunch friend of the school. In an eloquent speech Lord Leverhulme paid a high tribute to Sir Alfred Jones as a man of indefatigable energy and large vision, and stated that his work on behalf of tropical medicine was his best monument. The laboratories, which were completed just before the war, were in use until last year as a military hospital, devoted specially to cases of malaria and other tropical diseases. Since being handed back by the War Office they have been repainted and decorated, and the function of Saturday marked their formal opening. Situated in Pembroke-place, within easy reach of the Royal Infirmary and the University, the laboratories are commodious and up to date. On the ground floor there is an excellent museum, the exhibits in which excited great interest among the guests at the opening function, a lecture room, and a well-equipped library. The higher floors are devoted to laboratories for research and instruction. In the evening Sir Francis Dawson gave a banquet in the Exchange Hotel to over 100 guests, when tribute was paid to the work of the tropical school, and hopes were expressed for the work to which it is setting its hand.

A SOMERSET SUPER-CENTENARIAN.—Mr. F. W. Stabbins, of Worle, near Weston-super-Mare, has recently celebrated his 105th birthday.

IN recognition of his long and distinguished connexion with the David Lewis Northern Hospital the committee of that institution has established a special department for the study of neurology, which is to be called "The W. B. Warrington Department for Nervous Diseases." This is generally regarded as a fitting tribute to the memory of one who did much pioneer work in this branch of medicine while honorary physician there.

DEATH OF DR. ARTHUR SHEPHERD.—The death took place at Shethin, Tarves, on July 19th, of Arthur Shepherd, M.B., Ch.B. Aberd., Major, R.A.M.C., youngest son of the late Mr. George Shepherd, of Shethin. He was educated at the Aberdeen Grammar School and University, where he graduated in 1907, joining the R.A.M.C. in the same year. About 10 years ago he was sent to India and during the war he was in Mesopotamia with the Expeditionary Force. While abroad he contracted malaria and to a recurrence of the fever, when home on leave, his death is attributed. Major Shepherd was 35 years of age and unmarried.

THE LATE DR. R. M. SMYTH.—Dr. Robert Milner Smyth, assistant medical superintendent of Addington Hospital, Durban, Natal, was found dead in his bedroom by a native servant early in the morning of Wednesday, June 23rd. Death is certified to have been due to heart failure. Dr. Smyth was born in Dublin on Dec. 10th, 1868, and received his professional training at the Royal College of Surgeons, Ireland. Going out to Natal in 1898 he had served 22 years at the Addington Hospital, where he won a high reputation as a surgeon, and was socially very popular. He served with the British Forces in the Boer War in the capacity of civil surgeon, and he also saw service in the Natal Native Rebellion of 1906, and held medals and clasps for both campaigns. In the late war he served through the campaign in German S.W. Africa as O.C. No. 3 General Hospital, Northern Force, Swakopmund, and was promoted lieutenant-colonel, South African Medical Corps. Afterwards he was medical embarkation officer at the port of Durban, and was also in charge of the military section of Addington Hospital. For these services he was given the O.B.E. The funeral took place at Durban, and was accorded military and Masonic honours.

THE HOSPITALS OF DEVON.—The first meeting of the Devon Joint Committee of the British Red Cross Society and Order of St. John for the coördination of voluntary nursing and similar service was recently held at Exeter, when Sir Napier Burnett gave an interesting address. He stated there were 21 Poor-law infirmaries in Devon with 1484 beds, 19 or 20 infectious diseases hospitals with 469 beds, and 40 voluntary civil hospitals, including dispensaries, with 1160 beds. This made a total of 80 hospitals, 3113 beds, representing 4·44 beds for each 1000 of the population. The ratio for the beds in the voluntary civil hospitals was 1·65 per 1000, and this was nearly sufficient in an agricultural county with a scattered population, but in an industrial centre like Plymouth it should be about 3 per 1000. Sir N. Burnett remarked that broadly speaking Devon was not badly off for hospital accommodation, and also alluded to the fact that the Poor-law infirmaries in this country were more than half empty, adding that in one city there were 1000 vacant beds in these institutions, while in a civil hospital in the same city there was a large list of cases waiting for admission.

POOR-LAW MEDICAL OFFICERS' ASSOCIATION.—At the annual meeting of the association, held in London on July 15th, a discussion on Changes in the Poor-law Medical Service was introduced by the chairman of council, Dr. A. Lionel Baly, medical superintendent of the Lambeth Infirmary, who suggested that medical practitioners should be allowed to treat their own patients after removal to the infirmary. He held that there was nothing wrong with the Poor-law itself, but that it needed to be rightly administered. Dr. A. Withers Green, honorary secretary of the association, read a paper showing the increasing tendency to take the care and treatment of the sick out of the hands of the part-time district medical officers and to place it in those of the whole-time infirmary medical staff. The consequences which would result from this limitation were fully discussed, and the following resolution was passed unanimously:—

We, the Poor-law Medical Officers' Association of England and Wales, view with alarm the attempt now being made in some quarters to eliminate part-time district medical officers, to the disadvantage, we maintain, of the sick poor, and to place Poor-law treatment into the hands of whole-time resident medical officers in the various infirmaries. We consider it inadvisable that changes of this description be made till such time as the whole subject has been carefully considered and the best scheme for the general welfare has been decided upon.

A copy of the resolution is being sent to the Ministry of Health and to each of the boards of guardians in England and Wales.

MANCHESTER SMOKE SCREEN.—Under the presidency of Lord Newton, the Government Departmental Committee on Smoke and Noxious Vapours Abatement held two public meetings in Manchester last week. Apart from its effect on the health of the community, smoke is said to cause a loss of £1,000,000 annually in Manchester, and the question is what changes in the law in regard to pollution of the air would be likely to materially improve matters and lessen the heavy annual tax on health and property. Half of the smoke screen was alleged to be due to domestic fires, and consequently witnesses, bore testimony to the rival claims of gas and electricity for heating and domestic purposes. A cloud of witnesses testified to the magnitude and urgency of the evil, but the remedies suggested were few. The law already provides certain safeguards, but it was alleged that various local authorities were very lax in applying such rules the law prescribes; hence suggestions arose that instead of the regulations being left to be applied by the local authorities, they should be carried out by Government officials. Farmers complained of the deleterious effects of chemical fumes in the neighbourhood of Runcorn, others of the disastrous effects on their crops and cattle, and all the witnesses of the ineffectiveness of the inspection under the Alkali Act and of the difficulty of obtaining compensation for losses suffered. Pieces of muslin curtains, which had been hung in different parts of the city for periods of 7 to 14 days were all more or less black from the effects of smoke and emissions from chemical works. As to the health aspect, smoke by intercepting the direct rays of the sun made people more readily liable to tuberculosis, while fogs increased the mortality from phthisis, pneumonia, and bronchitis. It was suggested that in addition to local smoke inspectors there should be other inspectors appointed by the Ministry of Health with power to institute proceedings independently. The committee besides taking evidence visited some works in the district.

ABERDEEN UNIVERSITY COURT.—At the recent meeting of the Aberdeen University Court, Principal Sir George Adam Smith presiding, the secretary intimated receipt of a legacy of £250 from the representatives of the late Dr. Albert J. Venn, of London, who graduated at Aberdeen University M.B. in 1872 and M.D. in 1875. He also reported receipt of a gift of £250 for the medical school from the executors of the estate of the late Mr. James Munday. The offer was accepted of a stained-glass window for the University, bequeathed by the late Mrs. Shand, widow of Professor Smith Shand, who occupied the chair of medicine in Aberdeen University for a long period. The Court decided to instal electro-cardiographic apparatus within the Faculty of Medicine. Dr. R. D. Lockhart, was appointed a lecturer in anatomy. It was agreed to institute a full-time lecturer in bacteriology within the department of pathology.

PRESENTATIONS TO MEDICAL MEN.—On the occasion of his retiring from the post of senior honorary surgeon to the Liverpool Stanley Hospital, Mr. F. C. Larkin was last week presented with a testimonial by a number of his medical and surgical friends. The testimonial took the form of an address, a copy of one of Haig's etchings, and a cheque. The presentation was made by Sir James Barr at a special meeting held in the Liverpool Medical Institution.—The Hospitals Committee of the Liverpool City Council made its annual inspection of the hospitals last week, and at the luncheon at Fazakerley Hospital the opportunity was seized to present Dr. Claude Rundle, who has been superintendent of the institution for the past 14 years, with a silver salver and a Georgian cake-dish on the occasion of his recent marriage.

A MEDICAL CENTENARIAN.—Dr. James Scarth Spence Logie, who died at Kirkwall, Orkney, on July 17th, in the 101st year of his age, was a son of the late William Logie, D.D., minister of St. Magnus Cathedral. He was educated at the Grammar School, Kirkwall, and Edinburgh University, and qualified L.R.C.S. Edin. in 1841, graduating the following year M.D. Edin. After qualifying he was for a short time an assistant in Carlisle before going for further study to Paris, returning to Kirkwall, whence his practice soon extended over the whole of Orkney. When he started practice there were no made roads in the islands, nor, with the exception of farm carts, wheeled vehicles. His professional visits were made on horseback over rough hill tracts or in small sailing-boats to the neighbouring islands, which in rough weather entailed constant danger. Dr. Logie, who had been medical officer to the Balfour Hospital, Orkney, and to the prison at Kirkwall, was also medical officer of health for that town. He completed his 100th year on May 12th last, when he was the recipient of letters and telegrams from the King, the Senatus of the Edinburgh University, and from the General Assembly of the Church of Scotland, of which he had been ordained an elder in 1855. Dr. Logie is survived by a daughter.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BROADWAY, T. B., M.B., Ch.B. Glasg., has been appointed Public Vaccinator for Dorchester.

BROMLEY, L., M.Ch., F.R.C.S., Surgeon to the Neurological Department, Guy's Hospital.

DAWE, J. H., M.B., C.M. Edin., Assistant Medical Officer at the Devon and Cornwall Sanatorium for Consumptives, Didworthy, Dartmoor.

GABRIEL, W. B., M.S. Lond., F.R.C.S. Eng., Assistant Surgeon to St. Mark's Hospital for Diseases of the Rectum, City-road, E.C.

KENDREW, A. J., *M.C.*, M.B., B.S. Lond., L.R.C.P., M.R.C.S., Honorary Surgeon to the North Devon Infirmary, Barnstaple.

SHEEN, A. W., C.B.E., M.S. Lond., F.R.C.S., Visiting Surgeon (for General Surgery) to Ministry of Pensions Hospitals, Orpington and Shepherd's Bush.

Certifying Surgeons under the Factory and Workshop Acts: BURNELL, G. F. (Truro); SPONG, J. F., M.R.C.S. Eng. (Tooting); YEOMAN, W. M., M.B. Durh. (Stokesley, North Riding).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen University.—Lecturer in Bacteriology. £500. Also Asst. in Path.

Bath City.—Asst. M.O.H. and Asst. Sch. M.O. £550.

Battersea General Hospital (incorporated), Battersea Park, S.W.—Res. M.O. £200.

Birkenhead Borough Hospital.—Jun. H.S. £200.

Birmingham General Dispensary.—Res. M.O. £400.

Birmingham University.—Lect. in Physiology. £250.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £150.

Bournemouth, Royal Victoria and West Hants Hospital.—Res. M.O. £200.

Bradford City Hospital, Leeds-road.—Asst. M.O. £350.

Bristol Royal Infirmary.—Non-Res. Anæsth. £100.

Chester Royal Infirmary.—H.P. £150.

City of London Hospital for Diseases of the Chest, Victoria Park, E.—Res. M.O. £250. Also H.P. £100.

Colchester, Severalls Mental Hospital.—Asst. M.O. 7 gs. per week.

Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.

Coventry Education Committee.—Two Sch. Dentists. £500.

Croydon General Hospital.—Second H.S. £150.

Derby County Borough Education Committee.—Asst. Sch. M.O. £500.

Derby, Derbyshire Education Committee.—School M.O.'s. £550.

Dumfries and Galloway Royal Infirmary.—Res. H.S.

Fulham Metropolitan Borough.—M.O. £1 11*s.* 6*d.* per session.

Gartnavel, Glasgow Royal Asylum.—Asst. M.O. £300.

Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. £175.

Hereford County and City Mental Hospital.—Jun. Asst. M.O. £350.

Hull Royal Infirmary.—Asst. H.S. £150.

Isle of Ely County Council.—Clin. Tuberc. O. and Asst. M.O.H. and Sch. M.O. £600.

Johannesburg, South African Institute for Medical Research.—Asst. Bacteriologist. £800.

King's Lynn, West Norfolk and King's Lynn Hospital.—Res M.O. £150.

Leasowe Hospital for Children, Cheshire.—Jun. M.O. £200.

Leeds City Tuberculosis Sanatorium, Killingbeck.—Res. Asst. M.O. £300.

Leeds General Infirmary.—Res. Surg. O. £200.

Leicestershire and Rutland Mental Hospital, Narborough, near Leicester.—Jun. Asst. M.O. £300.

Leith Hospital.—H.S. and H.P. £100.

Lincoln County Hospital.—Jun. H.S. £150.

Liverpool, David Lewis Northern Hospital.—Two H.P.'s and Three H.S.'s. £120. Also Asst. M.O., V.D. Dept. £150.

Liverpool, Fazakerley Sanatorium.—Asst. Res. M.O. £300.

Liverpool, Royal Children's Hospital.—Hon. P. and Hon. Asst. S.

Liverpool School of Tropical Medicine.—Three Medical Men for Clinical and Research Work in Tropical Medicine.

Llanelly Borough.—M.O. and Schools M.O. £750.

London Jewish Hospital, Stepney Green, E.—Clin. Asst. £70.

London Temperance Hospital, Hampstead-road, N.W.—Asst. Res. M.O. £120.

Louth Union.—M.O. £180.

Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.

Maidstone, West Kent General Hospital.—H.S. £250.

Manchester Children's Hospital, Pendlebury, near Manchester.—Two Res. M.O.'s. £150.

Manchester, City of.—M.O. £450 and war bonus of £307 15*s.* 6*d.*

Manchester, Crossley Sanatorium, Delamere Forest, Cheshire.—Asst. M.O. £350.

Manchester, Hulme Dispensary, Dale-street.—H.S. £400.

Manchester, Monsall Fever Hospital.—Sec. Med. Asst. and Third Med. Asst. £300 each.

Middlesex Hospital, W.—Cas. M.O. £2 a week.

Miller General Hospital for South-East London.—H.S. £150.

Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. Res. M.O. £200.

Preston Royal Infirmary.—Res. M.O. £180.

Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Asst Res. M.O. £60.

St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum, City-road, E.C.—H.S. £250.

St. Thomas's Hospital Medical School, Albert Embankment, S.E.—Demonstrator of Anat. £400.

Sheffield, East End Branch of the Children's Hospital.—H.S. £150.

Sheffield Royal Infirmary.—H.P. £150. Also Hon. M.O.

South London Hospital for Women, South Side, Clapham Common, S.W.—Female H.S. £100.

Southport General Infirmary.—Sen. H.S. and Jun. H.S. £250 and £175 respectively.

Stafford, Staffordshire General Infirmary.—H.S. £250.

Stockport General Infirmary.—Jun. Res. S. £200.

Sunderland Royal Infirmary (Children's Hospital).—Female Jun. Res. M.O. £150.

Swansea General and Eye Hospital.—Jun. H.S. £200.

Swindon Borough.—M.O.H. and Med. Supt. of Isolation Hospital. £900.

Taunton and Somerset Hospital.—Sen. and Jun. H.S.'s. £200 and £150 respectively.

Tiverton Hospital, Devon.—H.S. £100.

West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—H.P. £250.

Windsor, King Edward VII. Hospital.—H.S. £200.

Worcestershire County Council.—Asst. County M.O.'s and Sch. Oculist. £500 each.

The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Loughor.

Births, Marriages, and Deaths.

BIRTHS.

HEWITT.—On July 19th, at Pelton Holme, Ben Rhydding, Yorkshire, the wife of R. Conrad Hewitt, M.R.C.S., L.R.C.P., of a daughter.

PAVEY-SMITH.—On July 25th, at 9, Victoria-avenue, Harrogate, the wife of A. B. Pavey-Smith, *M.C.*, F.R.C.S., of a son.

WILSON.—On July 23rd, at Putney-hill, S.W., the wife of Alex. Wilson, M.D., of a son.

MARRIAGES.

KENNAWAY—DERRY.—On July 24th, at Christ Church, Lancaster-gate, Ernest Laurence Kennaway, M.D., D.Sc., to Nina Marion Derry, younger daughter of the late William Derry, of Birmingham, and Mrs. Derry.

DEATHS.

MCGHIE.—On July 23rd, at Bongate House, Appleby, Robert McGhie, M.D., of Oaklands, Mountain Ash, and of Trows, Lesmahagow, aged 50 years.

SANDILAND.—On July 7th, suddenly, Arthur Henry Sandiland, M.R.C.S., L.R.C.P., of 137, Southgate-road, London, N., aged 73 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, London.
The Socialist Illusion. By R. Tayler. Pp. 137. 2*s.* 6*d.*

BLACKWELL, BASIL, Oxford.
The Wooden Pegasus. By Edith Sitwell. Pp. 120. 6*s.*

BOHN, DE E. F., Haarlem.
Vergleichende Anatomie des Nervensystems. By Dr. Æ. B. Droogleever Fortuyn. Pp. 370. 12.50 Dutch guilders.

CHURCHILL, J. AND A., London.
Electro-Therapy: Its Rationale and Indications. By J. Curtis Webb, M.B. Pp. 90. 5*s.*

CORNISH BROS., Birmingham.
Original Observations and Theories on Cardiac Disease and the Normal Heart, with a Note on Alcohol. By M. B. Shipsey, M.B., B.Ch. Pp. 40. 1*s.* 3*d.*

FROWDE, HENRY, AND HODDER AND STOUGHTON, London.
Manual of Medicine. By A. S. Woodwark, M.D. 2nd ed. Pp. 487. 16*s.*

KARGER, S., Berlin.
Berliner Arzneiverordnungen mit Einschluss der physikalisch-diätetischen Therapie. By Dr. P. Reckzeh. Pp. 192.
Kompendium der Kinderheilkunde. By Prof. A. Niemann. Pp. 334.
Trauma und Nervensystem. By Dr. T. van Schelven. Pp. 304.
Die Hysterie. By O. Lessing. Pp. 46.
Wochenbett und Säuglingspflege. By Prof. E. Martin. Pp. 96.

"LA SEMANA MEDICA," Buenos Aires.
Las Amputaciones Cineplasticas. By Dr. G. B. Arana. Pp. 352.

MASSON ET CIE, Paris.
L'Anesthesie Locale en Ophtalmologie. By Dr. Durerger. Pp. 96. Fr. 6.50.

SANDS AND CO., London.
Vitalism and Scholasticism. By B. C. Windle, M.D., F.R.S. Pp. 356. 8*s.* 6*d.*
Twenty Cures at Lourdes Medically Discussed. By Dr. F. De Grandmaison. Authorised translation by Rev. H. G. Bérenot and Rev. L. Izard, M.R.C.S., L.R.C.P. With Preface by Sir Bertram Windle, M.D., F.R.S. Pp. 272. 7*s.*

YALE UNIVERSITY PRESS, New Haven, Connecticut, 280, Madison-avenue, New York City.
Collected Studies on the Pathology of War Gas Poisoning. By Major Milton C. Winternitz, M.D., M.C., U.S.A. Pp. 166. $20.00.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE.

MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.

A Course of Twelve Lectures on Neurology, open to Students and Graduates of the London Hospital and other Schools—

TUESDAY, August 3rd.—2 P.M., Lecture VII.:—Dr. Riddoch: Disorders of Sensibility from Lesions of Thalamus and Cerebral Cortex.

WEDNESDAY.—2 P.M., Lecture VIII.:—Dr. Thompson: Polyneuritis.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

TUESDAY, August 3rd.—12 noon, Mr. T. Gray: Demonstration of Fractures, &c. 4.30 P.M., Mr. Addison: Practical Surgery. I.

WEDNESDAY.—11.30 A.M., Mr. MacDonald: Demonstration of Cystoscopy. 4.30 P.M., Dr. Simson: Gynæcology.

THURSDAY.—10.30 A.M., Dr. Simson: Gynæcological Demonstration. 4.30 P.M., Dr. G. Stewart: The Sympathetic Nervous System.

FRIDAY.—12.15 P.M., Dr. Burnford: Applied Pathology. 4.30 P.M., Mr. B. Davis: Clinical Lecture:—I., Throat and Ear.

SATURDAY.—12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen.

Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.

MONDAY, August 2nd, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

CANCER HOSPITAL, Fulham-road, S.W.

Clinical Lectures on the Diagnosis and Treatment of Cancer.

FRIDAY, August 6th.—4.30 P.M., Mr. P. P. Cole: Cancer of the Lips and Jaws.

Communications, Letters, &c., to the Editor have been received from—

A.—Dr. J. L. Aymard, Cape Town; Actors' Orphanage, Lond.

B.—Dr. F. J. H. Bateman, Lond.; Mr. G. Bethell, Lond.; Dr. J. Brown, Blackpool; Miss Bligh, Paris; Lt.-Col. Sir J. W. Barrett, Melbourne; Sir J. Byers, Belfast; Mr. J. Burns, Edinburgh; Col. R. J. Blackham, Bearsted; Dr. W. C. Bosanquet, Lond.; Dr. W. Bell, Lowestoft; Mr. T. R. Brown, Sheffield.

C.—Central Midwives Board for Ireland, Dublin; Dr. F. G. Cawston, Durban; Dr. W. Cramer, Lond.; Messrs. Cassell and Co., Lond.; Dr. E. F. Cyriax, Lond.; Dr. C. Cuthbert, Glasgow; Dr. C. Coombs, Bristol.

D.—Dr. T. V. Dickinson, Lond.; Prof. G. Dreyer, Oxford; Mr. F. C. Doble, Oxford; Dr. S. Davies, Lond.

E.—Mr. L. Edwards, Lond.

F.—Freemasons' Hospital and Nursing Home, Lond.

G.—Dr. L. Gordon, Lond.; Great Northern Central Hospital, Lond., Sec. of; Dr. A. K. Gordon, Lond.; Dr. H. L. Gordon, Lond.

H.—Prof. W. S. Handley, Lond.; Dr. A. F. Hurst, Windsor.

I.—Insurance Committee for the County of London.

J.—Dr. D. L. Jones, Merthyr Tydfil; Dr. G. G. Johnstone, Lond.

K.—Mr. H. Kimpton, Lond.; Dr. R. Knox, Lond.; King Edward's Hospital for London; Dr. A. F. S. Kent, Manchester.

L.—Mr. R. Lake, Lond.; Dr. C. Lillingston, Gorleston-on-Sea; Dr. A. Loxton, Birmingham.

M.—Dr. W. C. Morton, Leeds; Dr. A. McCall, Lond.; Ministry of Health, Lond.; Ministry of Pensions, Lond.; Dr. J. A. Murray, Lond.; Medical Sickness, Annuity, and Life Assurance Society, Lond.; Dr. H. MacLean, Lond.; Dr. J. B. McDougall, Wakefield; Dr. D. MacAlpine, Lond.; *Medical Times*, New York.

N.—Mr. W. R. Newman, Lond.; Messrs. Joseph Nathan and Co., Lond.; National Safety Council, Lond.

O.—Dr. C. M. O'Brien, Dublin; Oxford Ophthalmological Congress, Hon. Sec. of.

P.—Mr. H. Platt, Manchester; Dr. V. Pleth, Sonora, California; Mr V. G. Plarr, Lond.; Panel Committee for the County of London; Sir D'Arcy Power, Lond.

Q.—Queen's University of Belfast.

R.—Royal Society of London; Dr. G. Riddoch, Lond.; Dr. J. E. H. Roberts, Lond.; Dr. J. A. Ryle, Lond.; Research Defence Society, Lond.; Dr. J. D. Rolleston, Lond.; Mr. A. de F. M. Robert, Jersey.

S.—Mr. R. V. Stanford, Cardiff; Messrs. G. Street and Co., Lond.; Dr. T. H. C. Stevenson, Lond.; Dr. J. Sinclair, Lond.; School Dentists' Society, Lond.

T.—Sir W. Thorburn, Lond.; Mr. R. Thompson, Lond.

U—University Grant Committee, Lond., Sec. of; University of Bristol; University of Sheffield, Registrar of.

W.—Dr. H. de C. Woodcock, Leeds; Dr. F. J. Waldo, Lond.; Worcester, Medical Officer of Health of; Rev. A. B. W. Whatton, Parkhurst; Sir G. S. Woodhead, Cambridge; Sir A. Lisle Webb, K.B.E., A.M.S., Lond.; Dr. G. Ward, Sevenoaks; White Star Line, Lond.; Dr. R. McN. Wilson, Lond.; Dr. C. H. Warner, Nottingham; West London Hospital Post-Graduate College; War Office Publicity Department, Lond.; Dr. W. A. Wynn, Birmingham.

Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Notes, Short Comments, and Answers to Correspondents.

DISEASES AND SOCIAL HABITS.

Sir Humphry Rolleston, in a recent address on "The Change of Type of Disease," has pointed out that "the varying resistance of the population to disease is concerned with both the periodicity of disease and the character of the epidemics," and, further, that "the resistance of individuals and races is obviously influenced by environment, such as overcrowding, overwork, bad food, and alcoholism, and thus both the incidence and the severity of the disease—conditions which must be distinguished from each other—become increased." Diseases, in fact, are prone to rise and fall as do empires, and the habits of men have much to do with these changes. In a charming book, "Sussex in Bygone Days," noticed in these columns on the occasion of the author's recent death, the late Mr. Nathaniel Paine Blaker, a well-known Brighton practitioner, reviewed the changes in social habits observed by him in the course of a long life in their influence on disease types. Two such changes—namely, growing temperance and respect for ventilation—have during the last 50 or 60 years been factors in the improvement of national health. In the earlier half of the last century, and, indeed, to well within living memory, the idea prevailed that night air was a carrier of disease by means of what was known as "miasma," and that at all costs it must be excluded from sleeping-rooms. According to Mr. Blaker the superstition dated from the days before coal came into general use, and arose out of the difficulty of warming the air, while disease was generally believed by our ancestors to be air-borne.

In compiling the lives of some 2000 medical men, whose activities lay in the period 1820–1920, Mr. Victor Plarr has had occasion to note that the careers of individuals practising in town and country are in some degree a reflection of changes in the social habits of their patients. In the earlier part of this selected period medical men worked hard, lived hard in a sense, and died comparatively young. Up to about the "eighties" of last century they mostly died soon after attaining the age of 60. For some reason or other 62 was for a long period the age at which the country practitioner departed this life. After the eighteen-eighties there occurs a marked change, and octogenarians become increasingly frequent. Mr. Blaker himself was 83 when he died on March 12th, 1920. The old physicians and surgeons prescribed stimulants and often took them themselves. Their patients drank a vast amount, and the short life and the merry one was in many cases the order of the day. It is a question, indeed, now that stimulants, especially wine, are too expensive to be freely indulged in by educated men whether life does not promise to become, not short and merry, but a *longueur*, punctuated by financial anxieties, carping tempers, and a constant pessimism. The word "fun," so common in old biographies, is not now heard or written. One is almost tempted privily to envy the old gentleman of 94 who told Mr. Blaker that he attributed his excellent health at a great age to his moderation in the matter of wine. "I was always very careful, I never drank much wine," said the venerable Mr. New, of Southwick, to his chuckling professional friend. "Five or six glasses at dinner, and the same after dinner, but I used to drink punch from 6 o'clock at night to 6 o'clock next morning." Like their patients the old country doctors probably never felt quite warm in winter. Wool was not worn; flannel was regarded as effeminate wear. Their glow was rather internal than external as they rode for miles on horseback or with numbed limbs on the top of a coach. The cold bath, or, indeed, any sort of all-over ablution, was little known before 1840. A man rose in his ultra-stuffy bedroom, suffering, it might be, from the "fun" of last night's punch, and experienced no glow from the morning bath. He breakfasted and dined too heavily, supped too late, was booted and riding on vile roads in all weathers for very many hours, played cards at night in close air, drank much incidentally, slept a very short series of hours, and died with worn-out arteries at a time when middle-age now begins. But he often laughed uproariously, and the open air was good for him, as Mr. Blaker points out. There is another side, however, to the picture. The Early Victorian medical man was often a pioneer in his own district of sanitary reform, though he may have set a poor example to his patients in matters of personal health. Ruining his own health by drinking that of others, he nevertheless often ruined his own private practice, unconsciously but honourably, by promoting public health, especially by the new methods of water-supply which came into vogue and honourably distinguished the history of

boroughs and rural districts under Queen Victoria. In the series of 2000 medical men to which we have already referred a very large proportion were sanitarian reformers in their own districts.

THE METROPOLITAN WATER-SUPPLY DURING JANUARY, FEBRUARY, AND MARCH, 1920.

WITH a slightly increased rainfall in January, 1920, compared with the average of the previous 37 years, there were variations in the quality of the raw water and drinking supplies from the different sources. The results of the chemical examination showed that the Thames raw water improved in quality, while that of the Lee deteriorated. The New River raw water gave a good chemical return, but with turbidity and bad colour. The filtered waters showed, generally speaking, a fall in chemical quality, but they were satisfactory from the bacteriological standpoint. February was a comparatively dry month, and the results of chemical examination indicated the Thames, Lee, and New River raw waters to be improved in quality, and the same results are reported in the case of the filtered waters. Compared with the year 1919 the Thames raw water proved to contain more, and the Lee and New River waters fewer, bacteria. The filtered waters were, however, satisfactory. The month of March showed a normal rainfall, and the chemical purity of the raw waters was maintained. The filtered waters also gave good results on chemical examination, and the raw waters of all three rivers contained fewer bacteria than the corresponding month in 1919; the bacteriological examinations of the filtered waters followed suit.

ROYAL ARMY VETERINARY CORPS.

IT appears from a recent reply to a question in the House of Commons that the post-war establishment of the Royal Army Veterinary Corps has not yet been finally settled. On a pre-war basis the establishment, including India, is 1 major-general, 6 colonels, 6 lieutenant-colonels, and 156 majors, captains, and lieutenants. The last three ranks are grouped under one head as promotion to the rank of major is by length of service. There are at present 3 major-generals, two of whom are holding colonels' appointments and are included in the establishment of colonels, on which there is no deficiency or surplus. There is a surplus of 2 in the rank of lieutenant-colonel. Two lieutenant-colonels hold the acting rank of colonel and 3 majors hold the acting rank of lieutenant-colonel owing to the temporary continuance of colonels' and lieutenant-colonels' appointments in excess of the normal requirements. Allowing for a recent increase of establishment of 30 in India, there is a total deficiency of 11 in the establishment of regular officers of the corps, which is met by the employment of Special Reserve, Territorial Force, and temporary officers. All officers are paid at the rates laid down for their rank with the exception of the major-general holding a colonel's appointment in England, who is paid as a colonel. Since April, 1918, 2 lieutenant-colonels, 7 majors, and 8 captains have voluntarily retired, and no further retirements are at present under consideration.

FLOUR AS CATTLE FOOD.

THE Ministry of Food denies that there has been any increase in recent years in the number of firms mixing with cattle food flour purporting to be damaged and unfit for human food, nor is there reason to believe that any proportion of flour which is condemned as unfit for human food would be suitable for bread or for like purposes. The enforcement inspectors of the Ministry are constantly engaged in making investigations with a view to detection of offences against the orders relating to the use of flour for purposes other than human food.

A SHERRYGLASSFUL.

THE following prescription was brought by a patient to the practitioner who has sent it on to us for our consideration:—

For Mr. P. *Mixture No. 1.* 1920.

℞. Quininæ Sulphatis, grs. 80.
Acidi Sulph. dil. q.s.
Aquam, oz. 8.

Solve. Half a sherryglassful (2 tablespoonfuls or one-eighth of the bottleful) every day just before breakfast, without fail. The bottle to be refilled once a week for more weeks.

It was received by the sufferer from a specialist on a medical board. Our correspondent criticises the prescription severely from the point of view that it emanates from a specialist, but we take it that the special learning of the physician was rather displayed in making the diagnosis than in inventing the prescription. There can be no doubt that in many cases the treatment would be quite efficacious. One thing that has puzzled our correspondent in this prescription is "how the specialist came to think of this measure—the sherryglassful"; but surely the connexion of the wineglass with prescribing is fairly old and originated at a time when the wineglass was uniform in capacity and constituted the eighth of a bottle. Since those days wineglasses have been enlarged, notably for champagne and claret, and diminished for liqueurs, while for sherry the glass has remained more or less the same size; and by a coincidence sherry is the only recognised wine in the British Pharmacopœia. Our correspondent criticises the prescription severely for other reasons, in that it is not stated how often the bottle is to be refilled and is not signed or dated.

A PROPOSED FREE STATE MEDICAL SERVICE FOR SOUTH AFRICA.

IN the Union House of Assembly, Capetown, on June 29th, Mr. Hills, Labour Member for Springs (Witwatersrand), moved the appointment of a Select Committee to report upon the advisability of establishing a State medical service to provide free medical and hospital treatment. Mr. Hills pointed out the great increase in medical fees which made it almost impossible, he said, for people to avail themselves of medical assistance. On the other hand, there was the legal criminal responsibility incurred for not calling in medical aid. He referred to the great charge on the State which resulted from children growing up without the necessary medical treatment. The curing of the sick was a service inherent in any civilised community, and this was the principle underlying the motion.—Mr. Gow, in seconding the motion, said that he recognised the sacrifices made by the medical and nursing professions, which had done more for the sick than any other section of the community, but there was a large section of the community who could never afford to pay for a doctor or a nurse.

The Minister of Public Health, while agreeing with much that had been said, held that it would be practically impossible to carry out the principles of the motion. There were about 2500 doctors in the Union of South Africa, and their salaries would, he took it, average roughly about £1000 a year. The resolution therefore meant that the State would be called upon to bear an expenditure of £2,500,000 per annum, and, in addition, the cost of medicines and nurses. He feared, too, that if they tried to establish the principle proposed the medical men required would not be available. At the present time any person who was unable to pay was taken in free at all the State-aided hospitals, and he feared it would be difficult to go further just now. Government district surgeons also gave treatment and medicines free where necessary, and the Government was endeavouring to meet the needs of outlying districts.

Mr. Alexander (Unionist Member for Capetown) moved as an amendment to apply the motion to people unable to pay for treatment, or, alternatively, that a national insurance scheme be established to deal with cases of chronic invalidity or sickness. This amendment having been negatived by 51 votes to 43, the original motion was then defeated by 74 votes to 24.

INSANITY IN SCOTLAND.

THE sixth annual report of the General Board of Control for Scotland has just been issued, and shows that on Jan. 1st of this year there were 17,580 insane persons of whom the Board had official cognisance. The number included inmates of training schools for imbecile children who had not been certified under the Mental Deficiency Act, but was exclusive of insane persons maintained at home. Consideration of the total numbers of all certified patient shows that on Jan. 1st, 1916, there were 18,842 patients on the Board's register, as against 17,432 at the same date this year, being a decrease of 1410. The total number of patients admitted to establishments during 1919 was 3619. The admission-rate, which began to decline at the beginning of the war, appears to be resuming its usual rate of increase. The number of private patients discharged as recovered was 316, which is 66 more than in the previous year, while 955 paupers recovered—an increase of 145. The death-rate was 12·1, as against 14·6, the decrease being mainly due to the absence of epidemic diseases. The cost of maintaining pauper patients in asylums works out at 14*s.* 7*d.* per week, in licensed wards of poorhouses 13*s.* 8*d.*, and in private dwellings 9*s.* 7*d.* It is recorded with satisfaction that the limitation to £20,000 of the Government grant to local authorities has been removed by an amending Act, and that henceforth one-half of the costs of maintenance will be paid from Imperial funds

IN the *Hospital* for July 24th Mr. Gilbert G. Panter, secretary of the Great Northern Hospital, outlines a scheme of voluntary insurance for the purpose of providing a stable income for voluntary hospitals. The suggested insurance might serve to meet the demand on the part of workers for a definite guarantee of tangible benefits in exchange for their contributions.

Veritas has failed to substantiate his information by adding his name and address. There is nothing to prevent persons not on the Medical Register from giving so-called medical service. What they are not allowed to do is to represent that they possess medical qualifications.

Mr. W. R. N. does not describe what his practice is or give any detailed information concerning his patients. The matter is one that might be reported to the medical officer of health. It is quite outside the sphere of the General Medical Council.

Horace Dobell Lecture

ON

BACTERIAL INTOXICATION.

Delivered before the Royal College of Physicians of London.

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LECTURER ON BACTERIOLOGY, UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, AND HONORARY MEDICAL OFFICER IN CHARGE OF THE VACCINE DEPARTMENT, UNIVERSITY COLLEGE HOSPITAL.

MR. PRESIDENT AND GENTLEMEN,—In this lecture I propose to deal with some recent experiments on bacterial intoxication, dividing my observations into two parts: I. Those dealing with the bacteria themselves. II. Those dealing with the infected animals.

I. OBSERVATIONS ON THE BACTERIA THEMSELVES.

(a) "Washed Spores" and Latency of Infection and Intoxication.

It has become an accepted fact in text-books that the spores of bacteria carefully freed from their toxin do not germinate when inoculated into a susceptible animal. Their fate is variously described according to the result to be explained. Thus it is found that lactic acid inoculated simultaneously with the washed spores causes infection to take place with typical intoxication. This is explained by saying that lactic acid prevents phagocytosis of the spores, and thus their destruction is inhibited and germination followed by toxin formation is allowed to occur. Again, the injection of lactic acid, quinine, &c., may cause infection and toxin formation to occur days and even weeks after the inoculation of the spores. Here the idea is that the spores have remained latent either at the seat of inoculation or in the other tissues, and that the lactic acid by causing destruction of tissue produces a suitable medium for the germination of the spores.

The original work on the persistence of the washed spore in its latent state after inoculation was published by Tarozzi and confirmed and extended by Carforna. Their work, however, is valueless from the point of view of latency of the spore, because nowhere in their experiments has any attempt been made to differentiate between germinated forms and spores. It was taken for granted that the growths developing from the culture of the infected tissues must be from latent spores. Koser and McClelland subsequently investigated the same subject, but did not really determine if any of the spores became vegetative forms. They only showed that the washed spores of aerobic organisms rapidly disappeared both from the seat of inoculation and the internal organs, and that the washed spores of the obligatory anaerobes survived for some time. They made no effort to ascertain if in the case of the aerobic bacteria the disappearance of the spores could be accounted for by their germination into vegetative forms, and if the same did not occur to a lesser extent with those from the obligatory anaerobes.

Dr. E. Bach and myself investigated this problem some time ago with a view of studying the reason of the latency of the symptoms of intoxication following injection of these washed spores.

We experimented with carefully washed spores obtained by subjecting well-spored cultures to 80° C. moist heat for three hours. These spores from both types of organisms were inoculated by various routes into susceptible animals, and at intervals the organs of these animals were taken sterilely, emulsified, and cultures made from these emulsions: (*a*) From the emulsions direct, to obtain the total number of bacteria present either as spores, vegetative forms, or both. (*b*) After heating the emulsion to 80° C. for 30 minutes, to obtain the number of spores present, and by comparison with the results of (*a*) to get the number of vegetative forms. In addition the washed spores were inoculated intravenously into rabbits and the rate of disappearance from the peripheral circulation noted. Thus, a rabbit of 2020 g. was inoculated in the vein of one ear with ½ c.cm. of a very thick emulsion of washed anthrax spores. Cultures were made from the blood from the opposite ear vein at intervals, and the result was as follows.

Directly after inoculation	there were	50,000	spores	per c.cm.
5 minutes	,, ,,	10,000	,,	,,
10 ,,	,, ,,	2,000	,,	,,
15 ,,	,, ,,	800	,,	,,
30 ,,	,, ,,	800	,,	,,
60 ,,	,, ,,	400	,,	,,
2 hours	,, ,,	100	,,	,,
3 ,,	,, ,,	nil	,,	,,
5 ,,	,, ,,	nil	,,	,,

Experiments performed on guinea-pigs inoculated with washed spores and killed at different intervals show that the removal of the spores from the peripheral circulation is due to phagocytosis occurring especially in the capillaries of the liver, spleen, and lungs. The mechanism is that the spores, like the vegetative forms of bacteria, act as foreign bodies, cause a process of beginning clot formation in the capillaries of the above-mentioned organs, and get entangled in the small masses of clot thus produced. The leucocytes are attracted to these masses of bacteria-containing clots and the bacteria become phagocyted. Intraperitoneal injection shows a similar process of phagocytosis by the endothelial cells of the omentum, and later by the polymorphonuclear leucocytes, just as for vegetative bacteria. With subcutaneous inoculation numbers of spores are phagocyted, but a relatively large number remain free for a long time. This is not peculiar to the spores; ordinary vegetative bacteria are found to remain free for quite long periods in the subcutaneous tissues.

These results show that the washed spores on injection into an animal are treated just like ordinary vegetative forms of bacteria, as regards phagocytosis, &c. The following experiments will show what happens later to the injected spores.

Experimental Results.

1. Constant amounts of carefully washed spores of *B. anthracis* were inoculated intravenously into a series of guinea-pigs. The animals were kept alive for various periods and emulsions were made from the spleen and plated.

	Emulsion unheated.	Emulsion heated to 80° C. for 30 minutes = latent spores.
1 day after inoculation	1,200,000	Nil.
2 days ,, ,, ...	800,000	,,
3 ,, ,, ,, ...	350,000	,,
5 ,, ,, ,, ...	80,000	,,
7 ,, ,, ,, ...	10,000	,,
14 ,, ,, ,, ...	7,000	,,

2. *B. œdematis maligni*, washed spores, also inoculated intravenously into guinea-pigs, spleens plated.

	Emulsion unheated.	Emulsion heated to 80° C. for 30 minutes.
1 day after inoculation	860,000	24,000
2 days ,, ,, ...	180,000	2,600
4 ,, ,, ,, ...	80,000	1,400
10 ,, ,, ,, ...	2,000	20

These experiments show that the spores of aerobic and obligatory anaerobic bacteria germinate when inoculated into a susceptible animal, and this in spite of the phagocytosis which goes on directly after their inoculation. The spores of the aerobic organisms germinate more completely and rapidly than those of the anaerobes; also the spores appear to persist in the subcutaneous tissues at the seat of inoculation longer than in the internal organs. The question then arises as to what happens: the phagocyted spores apparently are not all killed, a large number germinate. Sections made from the internal organs of an animal inoculated some days previously with washed spores show that there are free vegetative forms in large numbers in the capillaries, of the liver, &c., not in the wandering nor apparently in the endothelial phagocytes. Smears made from the peritoneal cavity and omentum two days after the inoculation of washed spores of *B. anthracis* show 90 per cent. spores phagocyted, 10 per cent. free, 70 per cent. bacteria are free, 30 per cent. phagocyted; and five days after inoculation show that 97 per cent. of the spores are phagocyted and 3 per cent. free, and that of the vegetative forms 60 per cent. are phagocyted and 40 per cent. free. The spores form 60 per cent. of the total forms, the vegetative 40 per cent.

The examinations of the smears from the peritoneum after inoculation into that cavity, taken in conjunction with the cultural counts, show that a large number of the spores have been killed. Hence we must come to the conclusion that when washed spores are inoculated into a susceptible animal large numbers are destroyed, but quite large numbers germinate and these forms become only slowly phagocyted and destroyed, and that in spite of the presence of large numbers of these germinated vegetative forms in the animal it exhibits no signs of poisoning. The germinated vegetative forms are incapable of provoking intoxication.

These experiments further show that the germinated forms do not appear to multiply but become relatively slowly destroyed. Hence they must be able to derive sufficient food from the infected host to enable them to survive for some time, and, on the other hand, to be so little irritative or foreign that they are not rapidly phagocyted or destroyed in the plasma or phagocyte. It becomes evident, therefore, that these vegetative forms from washed spores (1) do not secrete a toxic substance (tetanus bacillus, *B. welchii*), or (2) are so slowly disintegrated that any possible preformed endotoxin is liberated in such small quantities at a time that it has no apparent effect on the infected animal. It cannot be argued that the washed spores have been so affected by the preliminary treatment that they give rise to avirulent vegetative forms, which only become virulent as the result of future accidents—e.g., injection of lactic acid, &c. This can be shown not to be the case, since if inoculated intraperitoneally with some 30 per cent. gelatine or sterile blood charcoal, typical infection occurs with these spores.

It has long been known that simultaneous inoculation of lactic acid, quinine, other organisms or trauma will cause fatal infection to occur from these washed spores. The injection or trauma need not be simultaneous with the spore inoculation, they may occur days after.

Influence of Secondary Factors in Toxicity.

The question is, how do these secondary factors affect the toxicity of the vegetative forms arising from the washed spores? Metchnikoff stated that lactic acid acted as a negative chemiotactic agent, and that when inoculated with the washed spores it inhibited their phagocytosis and hence their destruction, and thus allowed germination to occur with fatally resulting infection. He adduced as further proof of this the experiment of placing the washed spores in bags of filter paper, and introducing these into the tissues. He argued that the filter-paper capsule prevented the phagocytes from getting into contact with the spores, so germination was not impeded and the vegetative forms thus produced caused infection in the ordinary way.

Our experiments, however, completely negative these suggestions. In the first place, lactic acid does not act as a negative chemiotactic agent (at any rate in the early stages of phagocytosis); and, secondly, the injection of lactic acid will produce the same result when made days after the spore inoculation. In this case it cannot be claimed that the lactic acid interferes with an already accomplished phagocytosis. Further, a fatal result may be produced by the simultaneous inoculation of sterile blood charcoal with the spores—here there can be no question of the charcoal interfering with phagocytosis.

How, then, does the lactic acid act? It does not interfere with phagocytosis in the early stages, and later, even if it did, this factor alone would not alter the condition of things, since the germinated forms are largely free, as seen from the microscopic evidence already adduced. Lactic acid when injected will cause the lowering of the antitryptic titre of the plasma, and 0·5 c.cm. of N/1 lactic acid inoculated into a guinea-pig of 250–300 g. ought to produce a considerable fall, since 5 c.cm. N/1 lactic acid inoculated intravenously causes the antitryptic titre in a rabbit of 2000 g. to fall to 30 per cent. It is known that 0·5 c.cm. of N/1 lactic acid usually provokes a fatal result in guinea-pigs previously inoculated with washed spores. It might be thought that the destruction of antitrypsin by the lactic acid allows of autolytic digestion of the blood plasma, so that the bacteria would find a sufficiency of easily assimilable food and so start multiplying vigorously, and thus bring about a fatal issue. At first sight this might be supposed to be the explanation, since the intraperitoneal injection of gelatine into an animal inoculated shortly before with washed spores will produce a like result, the gelatine acting as the suitable nutrient medium in vivo. On closer and further examination this cannot be maintained, since subsequent injection of peptone does not produce a like result, and, more important still, the lactic acid does not produce a multiplication of the bacteria. In the case of the experiment with the washed spores of *B. anthracis*, the subsequent injection of lactic acid will produce a fatal result 14–21 days after the inoculation of the spores, but the post-mortem appearances are not at all typical of anthrax infection; the spleen is small and pale, the blood and the various tissues are not crowded with bacilli; in fact, the tissues appear microscopically free from the anthrax bacillus, and culturally the blood and tissues give no greater growths than controls which had no lactic acid. Then, again, lactic acid may act by causing damage to the tissues at the seat of its inoculation and autolytic degradation of the affected tissue; forming a nidus for the further development of bacteria locally and supplying digestive products for the others. As far as local damage is concerned, the injection of Gram's solution of iodine does not produce a fatal result in these cases, although in some cases the mere production of a wound or stirring up a wound will produce a lighting up in the human subject—but here it is not damage far away from, but at the seat of original infection, and the direct influence of mechanical irritation, &c., on the bacteria must be taken into account. Lactic acid might also conceivably act in a general way in the tissues, lowering their resistance and so allowing the bacteria to multiply and produce toxic substances. The injection of lactic acid diminishes the buffer salts, and so may hinder the removal of CO_2 from the tissues, but against this mode of action is the fact that sodium carbonate can cause a fatal result in animals inoculated with washed spores. These conjectures are, on the whole, very unsatisfactory—the best explanation is that the action of the chemical, drug, &c., is a direct one on both the tissues and bacteria, altering the existing mutual equilibrium of the environment of the one to the other.

Habituation to Environment of Bacteria Born in Captivity.

It would appear from the experimental evidence that bacteria born in the tissues from washed spores have become habituated to their environment, are able to carry on their vital functions, except multiplication, and do not act as irritants to the tissue, and consequently only become slowly phagocyted and destroyed. The injection of acids, alkalies, drugs, &c., affects the relative condition of habituation—the balance is disturbed and, as we shall presently see, interactions take place, producing toxic substances. In the case of the tetanus bacillus this alteration leads to the secretion of the exotoxin.

These observations show that: (i.) Washed spores do not all remain "latent." (ii.) The germinated forms do not give rise to the formation of toxic substances, this being due to either (*a*) the slow liberation of the toxalbumin because of the slow disintegration; (*b*) the habituation of these germinated forms to the physical conditions of the tissues and vice versa, disturbance of this leading to interaction, alteration of surface tension, &c., and toxin formation.

(*b*) *Evidence from the Treatment of Bacterial Protein in Various Ways.*

These may be summarised as follows:—

1. The intimate disintegration of the bacterial protein by grinding alone or grinding at very low temperature. These methods produce a very finely divided bacterial substance, which, as the result of the division, has become correspondingly increasedly toxic. This increase in toxicity is only carried to a certain degree; the so-called endotoxin thus produced never causes a sudden death, such as would occur with greatly increased doses of the alkaloids—e.g., strychnine, there is always a latent period of several hours. Then, again, the endotoxins obtained in this way from the different bacteria have no distinctive characteristic such as one would expect if there were specific endotoxins in the different varieties of bacteria; they all give rise to signs of intense poisoning without any characteristic symptoms. This method of pulverisation may be supposed to act in one or both of two ways. (1) Rendering available for immediate use and rapid action of a possible preformed toxalbumen or toxalbumose, which would be non-specific, simply that the albumin is primarily toxic; like protamine is among the ordinary animal proteins. (2) The fine state of pulverisation of the bacterial protoplasm exposes for a given amount of bacteria an infinitely greater surface for interaction with the antibodies in the tissues and tissue fluids, hence the interaction becomes more rapid, more intense, and a consequent greater and more rapid accumulation of the products of interaction occurs, which as we shall see later, probably produce the toxic effects.

2. *Maceration of the bacteria.*—Here the bacteria are allowed to undergo varying degrees of autolytic degradation and maceration, so that in addition to the greatly increased fineness of division of the bacterial protein, acting in the way already discussed, proteose bodies are also formed which produce the type of acute or delayed anaphylactic death. By carefully timing the duration of and hence the degree of maceration, &c., an acutely toxic suspension can be obtained, producing "anaphylactic" phenomena.

3. *Hydrolytic cleavage by alkalies, &c.*—Here the process is not the liberation of a preformed toxic substance, but the formation of hydrolytic cleavage bodies which can be acutely toxic. By none of these methods, therefore, can specific endotoxins be demonstrated.

II. OBSERVATIONS FROM THE SYMPTOMATOLOGY OF BACTERIAL INFECTION OF ANIMALS.

The Post-mortem Appearances, the Toxicity, and Chemical Changes in the Tissues.

Vaughan and Wheeler, and Teale and Embleton independently drew attention to the uniformity of the symptoms of fatal bacterial infection in animals of the same species. In the main these can be summarised as follows:—

After the initial symptoms of invasion the signs of the intoxication are: 1. Gradually falling temperature, so that the animal dies with a temperature of 94° F. or less. 2. Gradually increasing paresis spreading from the posterior to the anterior extremities. 3. Convulsive seizures and respiratory disturbances. In rabbits these convulsive seizures are very marked, the animal getting laboured, then spasmodic respirations, then frequently a loud cry and a convulsive seizure, with rapid death. 4. Post mortem, right-sided distension, diminished coagulability of the blood, accumulation of blood fluids in the tissues, and in guinea-pigs distension of the lungs.

A. Vaughan and Wheeler thought that the antibodies in the tissues acted upon the bacterial protein and liberated by a process of cleavage a preformed toxic substance, and that although in the main the action of the toxic substance from different sources was very similar, there were some individual differences. Vaughan maintains that the toxic substances he obtains by treating various proteins with alcoholic potash are not products of hydrolysis of the protein, but are pre-existent and merely split off from combination with other protein constituents, these together forming a non-toxic combination. It is very peculiar that such drastic treatment as boiling with alcoholic potash should only split off this preformed toxic substance and cause such disintegration of the rest of the protein as to produce a large amount of ammonium.

B. Then Jobling, Petersen, and other workers were similarly impressed by the uniformity of the symptoms of bacterial poisoning in animals of the same species. These observers thought that the symptoms are all due to proteose poisoning, but that the proteose is not derived from the digestion of the bacteria by the antibodies and complement acting as a proteolytic ferment, but that the proteose is formed from the animal's plasma. The bacteria, according to this theory, produce proteose intoxication by causing the adsorption of the plasma antitrypsin. This adsorption allows the plasma proteolytic ferment to auto-digest the plasma, and thus form toxic proteoses. Their idea is therefore that bacterial intoxication is due to varying degrees of peptone poisoning from the infected host's own plasma, and so bears a close relation to anaphylaxis, which they also explain as the result of proteose poisoning due to an autolytic degradation of the plasma brought about by the antigen adsorbing the antitrypsin and thus activating the plasma ferments. They also explain the formation of anaphylotoxin from bacteria in vitro by a similar theory, and then appear to bring into line some peculiarities which have been very puzzling—viz., why anaphylotoxin can be produced by exposing serum to non-bacterial substances, such as starch, agar, &c. Here, again, the idea is that bacteria, starch, &c., cause adsorption of the serum antitrypsin—this allows auto-digestion of the serum to take place with consequent formation of toxic proteoses. According to these observers, the antitryptic power resides in the unsaturated lipoids of the serum, and removal of these by solvents or adsorbents allows the proteolytic ferments of the serum to become active.

Dr. Bach and I also investigated the question of the relation of antitrypsin to infection, anaphylaxis, &c., but our results unfortunately do not agree with those of Jobling and his co-workers. Our experiments show:—

(i.) That the antitryptic power of a serum does not reside in the unsaturated lipoids. All the fats can be completely removed by Cathcart's method without affecting the antitryptic power of the serum. Further, we have been able to show that the antitrypsin of egg albumin is protein in nature, having been able to isolate it in a fairly pure state. (ii.) That the antitrypsin of the serum is not adsorbed in vitro by bacteria or by indifferent substances like agar, starch, &c., either at 0° C. or 37° C. (iii.) That after exposure to agar, starch, or dead bacteria, a serum becomes intensely toxic without any alteration in the antitryptic titre of that serum and without any chemical evidence of auto-digestion or digestion of the bacteria. (All these experiments had to be carried out with hæmoglobin free serum and with absolute bacterial sterility. For the latter reason diffusion methods were not used.) (iv.) That a weak proteolytic autolytic ferment exists in the serum of the guinea-pig, and a weaker one in the rabbit and man. The ferment can be demonstrated after destruction of the antitrypsin by chloroform in the cold, subsequent complete removal of the reagent by evaporation in vacuo followed by incubation at 37° C. A serum thus treated does not cause acute anaphylactic death—i.e., proteose poisoning. Jobling claims to have produced an intensely toxic serum by removing the antitrypsin by chloroform at 37° C., incubating and removing the chloroform by centrifugalisation and filtration. This does not remove the chloroform, and the acute death following intravenous injection of the serum treated in this way is due to chloroform. Chloroform at 37° C. also destroys the proteolytic ferment.

These experiments carried out by Dr. Bach and myself show that the substances which provoke the formation of anaphylotoxin in vitro do not do so by adsorbing antitrypsin, hence auto-digestion of the serum in the sense of the formation of toxic proteoses from it cannot occur, and we have to look for another explanation of the toxicity of a serum which has been thus exposed. Jobling further claims that by the intravenous injection of agar, kaolin, colloidal silicic acid, acute anaphylactic death can be produced. The theory being that these substances cause adsorption in vivo of the plasma antitrypsin which is rapidly followed by auto-digestion of the plasma.

Anaphylaxis.

Various observers use the term anaphylaxis very loosely, and it is very much to be deprecated; it gives a completely erroneous view of true anaphylaxis. The term should not be used simply for sudden death with convulsions, &c. In a great many cases where death is simply due to intravascular clotting the symptoms are very much like those of anaphylaxis; to this class belong the experiments of Jobling with agar, &c. These cases should not be called anaphylactic; they can easily be distinguished by the fact that, apart from post-mortem appearances, the preceding or simultaneous injection of an anti-coagulant like leech extract prevents a fatal issue, but does not do so with true anaphylactic shock; examples of this are the sudden death from intravascular clotting after intravenous injection of agar, silicic acid, carmine, muscle extract, &c. This theory of Jobling's further postulates that anaphylaxis is a blood reaction, which we now have reason to believe it is not. Jobling and his co-workers have therefore failed to establish the main points of their theory. In connexion with this Dr. Bach and I investigated the changes in the blood, tissues, and effusions in infected and in sensitised animals.

(a) Antitryptic Content of the Blood in Infection.

As the result of the inoculation of any form of protein, whether bacterial or otherwise, there is an alteration in the antitryptic content of the blood. The variation is fairly uniform with all forms of infection. There is at first a negative phase, beginning soon after the inoculation and reaching its maximum about 2-4 hours after the infection; this is followed by a return to normal in from 8-24 hours, and the rise is continued so that the antitryptic titre may reach 150-200 per cent. of the original. This usually lasts for 2-3 days and is followed by a gradual return to normal. The question then arises as to the meaning of this fall in the antitryptic titre and its relationship to infection and intoxication. In the first place, the animal infected may die with the antitryptic titre in any phase—negative in the first 2-4 hours, rising up to 18-24 hours, and even high above normal, 150-200 per cent., two or three days after infection. Even when acute deaths occur in 2-4 hours the titre has only fallen about 20 per cent. in the majority of cases. On the other hand, we have observations where the animal has recovered with a low antitryptic titre. Taking it as a whole, the antitryptic titre at the time of death depends on the duration of the infection. At first sight it would appear that the antitrypsin had become adsorbed by the infecting material, and consequently autodigestion of the plasma and the production of toxic proteoses might have occurred. It must be noted that the fall in the antitryptic content is only small and the presence of the remaining 80 per cent. means that the serum is not only capable of inhibiting any proteolytic enzyme in the serum but also added trypsin; hence, unless we postulate great local reductions sufficient to allow autolysis to go on in these local areas, the loss of antitrypsin as a whole will not be sufficient to allow of auto-degradation. The great objection to this antitrypsin loss accounting for bacterial intoxication by the possible production of proteoses by autodigestion of the plasma is given by the following experiment with lactic acid.

A rabbit of 2000 g. was inoculated intravenously with 5 c.cm. of N/1 lactic acid, and the antitryptic titre fell in 15 minutes to

66 per cent., in 30 minutes to 50 per cent., in 2 hours to 40 per cent., in 3 hours to 30 per cent., and remained so for 19 hours, then rose to normal in 30 hours after the inoculation. Here, in spite of the rapid and great fall of the antitryptic titre, the animal within 30 minutes of the injection was perfectly well and continued to be so. If, therefore, the destruction or adsorption of antitrypsin in vivo leads to a certain degree of autodigestion of the plasma, then with the lactic acid injection experiment, which almost completely destroys the antitryptic titre, a very violent proteose poisoning should occur, but there is absolutely no sign of poisoning in the remotest degree. Again, if the poisoning in infection were purely a proteose poisoning, resulting from autodigestion of the plasma following antitrypsin adsorption by the bacteria, it should follow that the rise in antitryptic titre to above normal should indicate a complete cessation of the activity of the autolytic ferment and a cessation of formation of toxic proteoses. If, however, it should still be held that the poisoning following bacterial infection is an autoproteose intoxication brought about as mentioned above, then with the rise in antitrypsin and cessation of poison formation there must be added another factor—viz., that the toxic proteoses may cause changes in the tissue cells, which continue after the proteose formation has ceased, and so lead to a fatal result. Again, there is also no difference in the type of antitryptic curve obtained in animals after injection with pathogenic or non-pathogenic bacteria, and therefore in both autodigestion of the host's blood plasma should occur equally. This is another argument against the theory of autodigestion intoxication in bacterial infection. The question, then, is what does the alteration in antitryptic content of the blood indicate? There seem to be two further possibilities to be considered. 1. That the fall in the early stages of infection is due to antitrypsin neutralising ferments liberated by the destruction of leucocytes. Against this, however, is the fact that the antitryptic titre rises as a fatal infection progresses. During this the liberation of leucocytic ferments due to continuing phagolysis ought to lead to a progressive diminution of the antitrypsin unless the initial loss is rapidly made up and ends by over-production. Another point against this is that the negative phase may be absent even with a fatal infection, on the one hand, and does occur when absolutely non-toxic substances, such as egg albumen or even cod-liver oil, are inoculated extraperitoneally. 2. That the antitrypsin influences tissue metabolism. This will be discussed later.

(b) The Relationship of Antitryptic Titre to Anaphylaxis.

I have already drawn attention to experiments which show that a highly toxic anaphylotoxin can be made without any evidence of antitryptic adsorption or autodigestion. I shall now state the results of our experiments in anaphylaxis.

In absolutely acute anaphylactic shock there is no loss of antitrypsin in the blood, in delayed shock there is a gradual loss, the loss varying directly with the prolongation of the symptoms leading to the death of the animal. In cases where there are severe symptoms followed by recovery the antitryptic curve is just like that during infection with bacteria. The fall in the subacute and delayed anaphylactic shocks may amount to 20 per cent., and is not much if at all greater than the fall due to the primary injection of the antigen in a normal animal. In acute anaphylactic shock, therefore, there can be no fulminating or rapid autodigestion of the serum, since there is no antitrypsin adsorption accompanying the combination of antigen with its specific antibody.

In the delayed shock the fall is not greater than with the primary antigen injection; hence, if the shock were solely due to proteose intoxication following antitrypsin absorption, it should be as great with the primary as with the second inoculation of antigen. Again, the experiments dealing with lactic acid injection must be borne in mind, here the fall in the antitryptic content is sudden and intense, yet there are no signs of acute proteose poisoning. It might be argued that the lactic acid destroys the ferment at the same time, and hence autodigestion does not occur. This is undoubtedly true in in vitro experiments, but, as Professor Baylis shows, there is no increase of H-ion concentration in the plasma even with the injection of such large amounts of acid as used in the experiment; hence the destruction of the ferment should not take place.

(c) Chemical Changes: Non-Coagulable Nitrogen.

Finally, Dr. Bach and I investigated the non-coagulable nitrogen in the blood during infection. During infection the animal takes no food, and in a normal animal during starvation the N.C.N. gradually falls. We have found that there is no demonstrable rise in non-coagulable nitrogen in the blood of the animal dying 1-4 hours after the infection, and none in acute or delayed anaphylactic shock, but as the period of infection is prolonged there is a corresponding increase in N.C.N. Dr. Bach and I have shown this is practically solely due to an accumulation of urea in the blood. There is very little evidence of the accumulation of amino-acid nitrogen in the blood during infection, and our methods are not delicate enough to demonstrate small quantities of proteoses. This increase in urea points to greatly increased tissue katabolism, and it appeared probable that the increase in antitrypsin might be accounted for as an effort to control this, to inhibit the intracellular proteolytic ferments. We accordingly performed experiments re the action of antitrypsin on tissue autolysis, and found that it had none, that serum only inhibited autolysis or slowed it down in so far as it diminished the amount of free acid available for the activation of the autolytic ferment. The activity of the autolytic ferment of the tissues is within limits proportional to the degree of acidity. Further, prepared antitrypsin from egg white had no influence on the autolytic ferments of fowls' organs.

Bacterial Poisoning the Result of Toxins Produced by Digestion of Bacteria.

C. The next point to be discussed is one which is older in date of conception—viz., the question of bacterial poisoning being due to digestion of the bacteria by the complement or complement and antibody, and according to the rate of accumulation of toxic proteoses from the digested bacteria symptoms occur. This conception was advanced some years ago by Dr. Embleton and myself. I want now to discuss this in the light of further knowledge and amend it. The idea of anaphylotoxin being the result of the proteolytic degradation of the antigen by means of its specific antibody and complement acting as the proteolytic enzyme is in the first place due to Friedberger. His work was apparently confirmed by Abderhalden in his demonstration of protective ferments. Now in all the methods used for demonstrating proteoses and digestive products in connexion with this work, Abderhalden and other workers did not carry out their experiments with absolute bacteriological sterility—and, in fact, with diffusion thimbles this is impossible. Dr. Bach and I carried out numerous experiments with scrupulous care with regard to bacteriological sterility to see if complement and specific antibody did act as a proteolytic enzyme on the homologous antigen; we were absolutely unable to find any trace of amino-acid nitrogen in these experiments, even when the experiment was carried on for days. Similarly we always got negative results with the Abderhalden test for pregnancy when carried out with complete bacteriological precautions. So from the direct chemical point of view we were unable to prove the proteolytic activity of complement and specific antibody.

There is, therefore, no direct proof in support of the theory that bacterial poisoning is due to the proteolytic degradation of the bacterial protein. There is only à priori evidence that proteoses can produce many of the symptoms of intoxication. Before discussing this matter further from this point of view, it will be advantageous to see if any evidence that toxic material can be demonstrated in the blood or effusions of animals dying from bacterial infection or anaphylaxis.

(1) With regard to the blood in infection. The great difficulty lies in the primary toxicity of the blood, especially if it has been whipped. Experimental evidence shows that the blood from an animal dying from bacterial infection is only slightly more toxic than that from a normal animal of the same species. The blood from animals dying from acute or delayed anaphylaxis is the same. The toxicity of the blood manifests itself on intravenous injection in the guinea-pig by causing the anaphylactic syndrome. (2) In effusions. There is no doubt that the effusions of animals dying from bacterial infection are highly toxic, so that doses of 2-3 c.cm. will cause acute anaphylactic death in normal guinea-pigs on intravenous inoculation. In these Dr. Bach and I have never been able to find any evidence of digestive products by methods other than diffusion methods.

The fact therefore emerges that "anaphylotoxin" can be demonstrated definitely in the effusions of infected animals, its demonstration in the blood is not so evident.

Is there any other evidence of "anaphylactic" phenomena occurring during infection? The symptoms already mentioned as being the prominent ones in the course of bacterial infection are very like those of delayed and protracted anaphylaxis—viz., the fall of temperature, fall of blood pressure, gradually increasing paresis, the respiratory troubles and convulsions, and post mortem the incoagulability of the blood and right-sided distension with pulmonary emphysema. Further, during the course of an infection by suddenly increasing the amount of bacterial protein an infected animal may be made to die quite acutely with typical acute anaphy-

lactic shock. Thus a rabbit infected with *B. coli* may, two to four hours after the infection, be killed quite acutely by the intravenous inoculation of one or two slopes of *B. coli*, the symptoms being rapidly increasing difficulty in breathing, sudden cry, convulsions, and death, with rapid fall of temperature and delayed coagulability of the blood. We have thus the evidence of (*a*) the presence of anaphylotoxin in the effusions; (*b*) the similarity between the symptoms of infective poisoning and anaphylaxis; (*c*) acute anaphylactic death may be brought about by further injection of antigen into an infected animal.

Relation of Antibody to Specific Antigen in the Causation of Symptoms of Intoxication.

Before the discussion of the possible nature of anaphylotoxin and anaphylaxis and their relation to toxicity and infection, the relationship of the antibody to the specific antigen in the causation of the symptoms of intoxication calls for examination.

This was discussed by Dr. Embleton and myself some years ago when we brought forward evidence from numerous experiments to show that the toxicity of a bacterium depends on the relative balance of its specific antibody to it. By altering their relationship the toxicity of a bacterium may be enhanced or diminished, and bacteria which previously were non-pathogenic may be made to cause infection, intoxication, and death. The amount of evidence bearing on this is fairly large. Thus, in addition to our own experiments there are those of Duval, who showed that living leprosy bacilli were not pathogenic to monkeys, but after sensitising monkeys with dead leprosy bacilli an inoculation with living bacilli was followed by typical infection and intoxication. Next is the experiment of Twort with the myco-bacterium bovis. This organism is absolutely non-pathogenic for the rabbit, but after a preliminary sensitising inoculation with dead bacteria a second one with the living bacteria produces typical infection and death. Similarly, take the pathogenicity of the human type of tubercle bacillus in the rabbit. As is well known, the human type is practically non-pathogenic for this animal, and the animal is used for differentiating by the pathogenicity test between the bovine and human types of bacilli. Dr. Embleton and I have shown that if rabbits are first inoculated with a dose of dead tubercle bacilli of the human type, after which they appear quite normal, have no fever or wasting, and then with a very small dose of living human bacilli, the rabbits will die of acute miliary tuberculosis. This has since been confirmed by experiments carried on by C. Austrian in the Johns Hopkins Hospital. Finally, there is our similar experiment with *B. mycoides*. The only drawback of this experiment is that occasionally by educating a cold growing *B. mycoides* to grow at 37° C. it becomes directly pathogenic, producing very rapid intoxication. But sometimes this is not the case, and the culture growing at 37° C. is not primarily pathogenic, but after sensitising a guinea-pig with dead bacteria of the same kind an inoculation of the living organism, which has proved to be innocuous in much larger doses, produces infection of the type *B. anthracis*. In addition to these experiments where the pathogenicity—i.e., the capability of an organism to produce infection and intoxication—is apparently brought about by increasing the antibody activity against it, there is another experiment which directly shows that an increased amount of antibody may directly increase the toxicity of a bacterium. Rabbits of the same size, weight, age, breed, &c., were inoculated (*a*) with a non-lethal dose of living or dead typhoid bacilli. Complete recovery occurred. (*b*) With the same dose of bacilli as in (*a*), but previously exposed to a high titre agglutinating serum, so that complete saturation had occurred. The injection of the sensitised bacilli caused death. In this experiment there can be no question of anything else but the increase in the antibody activity against the typhoid bacilli induced by the preliminary sensitisation of the bacteria; this increased amount of antibody has given rise to such an increased formation of poison from the same amount of bacteria that a fatal result has occurred. In the other experiments there is, in addition, the possibility of the preliminary inoculation producing a negative phase, and the probability that the further inoculation during this period of lessened resistance from diminution in antibody activity induces a summation of effects, and hence a fatal result.

Against the idea that the result of the above experiments are due to the production of a negative phase by the first injection and persisting to the time of the second one are:—

1. The supposed long duration of the negative phase in these experiments ten days. 2. That it is questionable if a negative phase ever occurs. Bull has lately not been able to demonstrate it after inoculating bacteria into animals possessing some degree of acquired immunity against them. Similarly the injection of red cells into an animal of another species is rapidly followed by the production of antibodies. 3. Experiments similar to the above do not give like results with other bacteria. Thus occasionally strains of *B. mycoides* are met with which are directly pathogenic in very small doses in a very short time—few hours. Now if a guinea-pig is inoculated with dead mycoides first and then later on, as in the above experiment, with living mycoides of the variety which is primarily pathogenic, the animal instead of dying, recovers. Here we have the animal recovering from a certainly fatal dose during a so-called negative phase. Hence we must conclude that the negative phase theory fails; that the fatal result is not due to an inoculation occurring whilst the animal is in the state of a "negative phase." If we next consider the large group of pathogenic bacteria, evidence has long since accumulated that by increasing the antibody activity against the various bacteria of this group a condition of increased resistance can be attained. Here, again, we have the intoxication due to bacterial infection affected by altering the antibody activity. Finally comes the group of bacteria to which the animal is very immune—i.e., the bacteria are non-pathogenic. This group cannot be made pathogenic—i.e., to produce the signs of intoxication if the immune animal is first of all inoculated with a large dose of dead bacteria and then with living ones of the same kind. The method of increasing the antibody does not increase the toxic formation, hence they are quite different from the first group; they again form a potent argument against infection in the first group, being due to inoculation during a negative phase. Here the relationship between antibody activity and antigen is such that when these bacteria are inoculated no toxic disturbance is produced by their interaction. There is further evidence from experiments in sensitised animals of the relation between the antibody activity and intoxication. If a series of guinea-pigs is inoculated with 20 c.mm. of a 10 per cent. sheep red cells suspension, on the thirteenth to fourteenth day the following results can be obtained on reinjection:—

	Result.
(1) Gp. reinoculated i.v. with 1 c.cm. of 10% sheep red cell suspension ...	Nil.
(2) ,, ,, ,, do. sensitised with 1 unit of amboceptor	Nil.
(3) ,, ,, ,, do. with 5 units of amboceptor	Nil.
(4) ,, ,, do. with 25 units of amboceptor	Animal ill, rapid recovery.
(5) ,, ,, ,, 100 units amboceptor	Acute death.
(6) ,, ,, ,, 500 ,, ,,	Do.

Here by increasing the amount of antibody acting in the tissue cell on the antigen a fatal result can be produced. The increase in the antibody does not act by increasing the lysis in the plasma, the antibody already there is sufficient to do so. In the second week of sensitisation the titre of the serum is as high as it is in the third week. Again, in partial desensitisations the effect of a small sublethal reinjection is to reduce the activity of the antibody as a whole, but acute shock can be still obtained after such partial desensitisation by injecting a very much larger dose of the homologous antigen than is necessary to cause the acute anaphylactic shock in a non-desensitised animal.

These experiments show the importance of the factor of the relationship between the balance of antibody activity and antigen in anaphylaxis.

Functions of Circulating and Tissue Antibodies.

I want now to consider the functions of the circulating and tissue antibodies. As the result of the experiments of Dr. Bach and myself it would appear (1) that the antibody-complement complex does not act as a proteolytic ferment as far as can be definitely ascertained by chemical means when the experiment is carried out with absolute sterility; (2) that the antibodies do not act as agglutinins or opsonins in vivo.

Dealing with bacteria inoculated into the circulation we have shown that they are not agglutinated in vivo by the natural or acquired antibodies. The bacteria are removed from the circulation by a process of clot formation occurring in the capillaries of the liver, spleen, and lungs, the bacteria acting as foreign particles, and then phagocytosis occurs. Even intensely pathogenic bacteria against which the animal has apparently no antibodies at all—e.g., the *B. dysenteriæ Shiga* in the rabbit, are removed from the peripheral circulation as rapidly as those against which the animal has an agglutinin. Further, the presence of a powerful agglutinin in the serum of an animal in no way hurries on the removal of the bacteria from the circulation, the rate of removal of pneumo-bacilli or typhoid bacilli occurs as rapidly in the normal as in a highly immunised animal with

a very high agglutinating titre against these organisms. Similarly in the serous cavities and subcutaneous tissues the antibodies can be shown not to act as agglutinins or opsonins. The process of phagocytosis is purely a response to the presence of foreign particles. The antibodies do not appear to hurry the process of removal and phagocytosis of the bacteria in the initial stages of infection. There is definite evidence, however, that the antibodies act as lysins in the circulation. This can be demonstrated by experiment with rabbits sensitised against red corpuscles; reinjection with the homologous red cells is always accompanied by hæmoglobinæmia. Lysis also plays an important part in the anaphylactic shock. Although acute anaphylactic shock is essentially a cellular reaction the lysis of the red cells is an important preliminary, since without this the antigen is unable to get into the cells wherein the reaction occurs. The excised uterus of a guinea-pig sensitised to red cells will only react if the homologous red cells used for the reaction are hæmolysed. Similarly in bacterial anaphylaxis reinoculation with the homologous whole bacteria does not bring about shock; only when a bacterial extract is used can acute shock be obtained. Comparing this with the ease with which acute shock occurs on reinjection of red cells in sensitised animals, it appears that lysis of bacteria must be relatively much slower. Dr. Bach and I have endeavoured to demonstrate the presence of lysed bacterial protein in the blood of infected animals by a complement-fixation test, but have failed to get any evidence of the presence of such lysed bacterial protein; it may be that it is rapidly taken up by the tissue cells. Zinsser and Parker claim, however, to have obtained positive results. The Pfeiffer phenomenon also shows that the antibodies cause lysis of bacteria in the serous cavities, and the same can be demonstrated in the subcutaneous tissues. Excess of antibodies, on the other hand, appears to prevent lysis of the homologous antigen. This is seen in the Neisser-Wechsberg phenomenon in vitro, and can be shown in vivo in highly immunised guinea-pigs. If some guinea-pigs are highly immunised against the cholera vibrio, reinjection of these vibrios into the peritoneal cavity is not followed by the ordinary Pfeiffer's reaction; the bacteria do not become motionless, nor swell out, nor break up into granules. This action only occurs in highly immunised animals, and has apparently no parallel in normal ones. The circulating antibodies would appear therefore to act chiefly by sensitising the bacteria (i.e., combining with them) before phagocytosis occurs, and then, owing to this, hurrying on the process of lysis and destruction in the phagocyte. In the serous cavities and subcutaneous tissues the same process of sensitisation occurs, but the rate of phagocytic removal is much slower. In the latter site the bacteria may remain free for quite long periods. Bacteria, either in the circulation or elsewhere, which have not been phagocyted may undergo extracellular lysis, and thus also finely divided bacterial protein will be rendered available for interaction in the tissue cells. Now, antibodies do not exist as such in the tissues; they cannot be demonstrated as such even in the most immune animals, though there can be no doubt that those in the body fluids are derived from the tissue cell. Vice versa, antibodies injected into an animal during passive immunisation become absorbed by the tissues and undergo some change there, so that, though they can no longer be demonstrated as such, they confer hypersensitiveness on the tissues. The tissues of an immunised animal which as a whole is not hypersensitive—i.e., in the anaphylactic state—appear to react in vitro like those of one in that state. It would thus appear that the circulating antibody is protective, so that by combining with the inoculated antigen it prevents the acute anaphylactic shock or even delayed shock. Here, again, the protection is relative; a highly immune animal with a large amount of circulating antibody can practically always be killed by acute anaphylactic shock or delayed shock by increasing the dose of homologous antigen inoculated. This analysis shows: 1. That there is a great similarity between the symptoms of bacterial intoxication and protracted anaphylactic shock. Occasionally acute anaphylactic symptoms may occur in an infected animal. Frequently the final symptoms are very much like those of acute anaphylactic shock. 2. The presence of "anaphylotoxin" in the effusions of animals dying from bacterial infection. This "anaphylotoxin" is not due to autodigestion of the plasma, nor due to proteolytic digestion of the bacterium. 3. That as in sensitised animals so in infection, the occurrence of poisoning can be affected by altering the balance of the antibody activity to the antigen. This cannot be explained by the antibody producing simply more rapid lysis and so liberation of preformed endotoxin, since in the experiments with *B. lepræ*, *B. mycobacterium bovis*, *B. tuberculosis* (human), &c., no rapid lysis occurs, the bacteria multiply and produce typical infection and not simply an intoxication.

Nature of Anaphylactic Shock.

The infection intoxication is more to be compared to protracted anaphylactic shock. Now, acute anaphylaxis is a tissue reaction. What is the nature of the protracted shock? Delayed anaphylactic shock occurs when the rate of entry of the reacting dose of antigen into the circulation and thence to the tissue-cells is slow—i.e., when the route is either the intraperitoneal or subcutaneous. Here the slow rate of entry allows partial and slow desensitisation of the activity of the cellular antibody to occur. The reaction between the first small dose of antigen and the antibody is relatively slight, partial desensitisation occurs, and as more antigen accumulates slowly in the cells this desensitisation gradually progresses, and thus the interaction and consequent toxic formation becomes less and less, and in this way the total toxic formation is not very great. In these cases the interaction producing the intoxication might be supposed to be largely or to some extent between the antigen and the circulating antibodies, the cellular antibody having become completely or greatly desensitised. But against this is the fact that after complete desensitisation intraperitoneal or even intravenous inoculation produce no toxic effects, and this is not due to complete loss of complement or antibody in the circulation. Hence delayed anaphylaxis is largely a cellular reaction, although the circulating antibody may play a part and some anaphylotoxin be produced in the serous cavities, &c.

Contrast between Infection and Anaphylaxis.

How far can infection be compared to this? Can a state of hypersensitiveness be demonstrated in the tissues of an animal highly susceptible to a certain bacterium?

There appears to be no evidence in favour of this. Dr. Bach and I prepared an extract of highly virulent *B. coli*, and added some to the excised uterus and intestine of a normal guinea-pig suspended in a bath of aerated Locke's fluid without producing any reaction. The animal which is highly susceptible to a given bacterium need not necessarily have its tissues in a state of complete hypersensitiveness, so as to produce the typical anaphylactic reaction when its unstriped muscle tissues are exposed to the lysed bacterial protein, the tissues may have various degrees of hypersensitiveness. This can be demonstrated in vivo by the varying temperature reactions occurring on reinjection with the homologous antigen in animals which have been sensitised for different periods, and so have different amounts of antibodies according to the interval elapsing between the first injection and the reinjection.

Course of Events in Infection.

In infection the course of events is much as follows: (1) The bacteria gain access usually to the tissues or serous cavities. Primary blood infection is rare. (2) In the tissues and serous cavities phagocytosis rapidly occurs; if the infection is small, then the phagocytosis may be almost complete, with bigger infections a certain number of the bacteria remain free for quite a long time. The bacteria phagocyted may—

(*a*) Be killed with little or no toxin production; (*b*) be killed with marked toxin production leading to phagolysis with the liberation of the killed and lysed bacteria and the toxins formed during the intra-phagocytic reaction. (*c*) mostly survive, some lysed, marked toxin production may occur; phagolysis ensues with liberation of the whole bacteria, lysed bacterial protein, and the results of the interaction.

Those left unphagocyted may be similarly affected in the tissue fluids. Here there will theoretically always be some "anaphylotoxin" production as the result of interaction between the bacteria and the fluids of the body, just as in an in vitro experiment with bacteria and serum. The toxic products of interaction in the free and fixed phagocytes are probably of a similar nature—these when sufficient in amount will produce the symptoms of fever, &c., as has been experimentally shown. When lysis occurs the lysed bacterial protein can the more readily gain access to the tissue cells in various parts of the body, and hence the interactions will occur more vigorously. If there is sufficient tissue antibody already present a certain degree of interaction with resulting intoxication will immediately take place, the intensity depending on the relative proportions of antigen and antibody, and in some cases acute death may occur. If death does not occur, there will be a certain degree of desensitisation of the antibody which may lead to freshly arrived

bacterial protein causing no or only slightly increased toxin formation. The arrival of this protein leads to the mobilisation and new formation of circulating antibodies and their tissue cell progenitors leading to a gradually increasing condition of hypersensitiveness. If there is no more protein, the bacteria having been finally completely destroyed in the phagocytes, plasma, &c., then there will be no more toxin production, the animal may recover or die as the result of the intoxication. If, however, the bacteria are not killed, more and more protein will get to these tissue cells and produce interactions leading to fresh toxin formation with periods of cessation or diminution owing to various degrees of desensitisation. In this way the fight goes on till either the animal dies, frequently with a violent terminal reaction producing a sort of acute anaphylactic type of death or recovers, in that finally all the bacteria and lysed protein are rendered harmless. In some cases the animal may die long after the initial infection, long after the bacteria have been killed, by reason of the increased tissue katabolism set up by the infection continuing. That such a process of toxin formation, increase in the amount of antibody, and periodic, partial, or complete desensitisation may occur is seen from the experiments of Friedberger, where it was possible to produce any type of temperature reaction in a normal or sensitised animal by varying the successive doses and intervals of inoculation of the antigen. It cannot, of course, be absolutely put out of court that bacterial protein in itself may be slightly toxic, and that when it gets into the tissue cells produce changes and interaction of the type of those produced by proteoses.

Certain Conclusions.

I think it can be regarded as probable that the toxin is apparently not due to (*a*) proteolytic degradation of the bacteria by the antibodies; (*b*) auto-digestion of the plasma; (*c*) preformed specific endotoxin; but (*d*) is due to some interaction, the nature of which is as yet obscure, occurring between the tissue and to a lesser extent the free antibodies and the infecting bacterial protein, and according to the intensity of interaction more or less intoxication occurs. The type of intoxication which suggests itself as occurring during the interaction is to my mind closely paralleled by the auto-poisoning produced from damaged muscles during wound shock.

The Croonian Lectures

ON THE

PSYCHOLOGY OF THE SPECIAL SENSES AND THEIR FUNCTIONAL DISORDERS.

Delivered before the Royal College of Physicians of London, June, 1920,

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LECTURE III.*—HEARING, LISTENING, AND HYSTERICAL DEAFNESS.

MR. PRESIDENT AND GENTLEMEN,—Hysterical deafness is probably less rare in civil life than has generally been supposed. In this lecture its ætiology will be primarily discussed in the light of experience gained from the observation of numerous cases occurring in soldiers, among whom it was comparatively common, and a small number of severe cases in civilians.

The noise and concussion produced by the explosion of a shell of high power in the near neighbourhood frequently caused deafness. The patient was dazed or unconscious as a result of the explosion, and when his mind became clear again he discovered that he could not hear. Both ears were generally affected, but the one on the side more exposed to the explosion of the shell was often deafer than the other. The initial deafness was doubtless due to concussion of the internal ear, as it was sometimes associated with vertigo and temporary nystagmus. One or both drums were often perforated owing to the sudden enormous change in atmospheric pressure. Such a perforation did not greatly affect the prognosis, as the tear generally healed, and in the absence of hysteria normal hearing was restored.

The deafness might pass off in the course of a few hours, but more frequently it lasted for a few days. If it persisted for a still longer period it was almost always hysterical, at any rate in part. The initial concussion-deafness made such an impression on the mind of the soldier that on coming to himself his first thought was for his hearing, and he might be so convinced that he was permanently deafened that he became actually deaf as a result of auto-suggestion. This was especially likely to be the case if for any reason the idea of deafness had previously entered his mind; it was for this reason that a large proportion of cases occurred in men who had old disease of the ear.

The temporary deafness, which was a familiar condition before the war both in gunners and other people who were exposed to the frequent repetition of loud noises, might in the same way become perpetuated and exaggerated by auto-suggestion.

Lastly, organic deafness, especially if the onset is acute, as in that due to involvement of the auditory nerve trunk in cerebro-spinal meningitis, may remain complete after the disappearance of the active disease has been followed by sufficient restoration of the structures involved for a certain amount of hearing to have returned. This, again, is due to auto-suggestion, the final deafness being organic with a superadded hysterical element, which is capable of removal, like all hysterical symptoms, by psychotherapy.

If left untreated without any encouragement, and especially if steps are taken to teach the patient lip-reading, he will become more and more convinced that he is permanently deaf, the effect of the original auto-suggestion being increased by the unconscious hetero-suggestion of those in charge of the patient.

PATHOGENESIS.

Hearing does not consist merely of the perception of impulses conveyed to the brain when the ear is stimulated by sound waves. It is an active process, and in order that sounds may be heard the individual must listen. Inattention during a dull sermon results not only in absence of perception of the words said, but of total deafness to the sound of the preacher's voice It is clear that impulses to the cortical centre of hearing must be actually interrupted by inattention. The most satisfactory theory is that in the act of listening the resistance at the various synapses in the auditory path becomes diminished by some such process as a throwing out of dendrites, which brings those of contiguous neurones into more intimate connexion. In inattention the synapses are unswitched, the resistance being increased by the retraction of the dendrites.

In animals there is an obvious motor element in listening in addition to the sensory element just considered. This is seen in the movements of the external ear, which is most obvious in those which depend upon flight, prompted by the acuity of their hearing, for safety from their enemies. If one pays attention to one's own sensations in the act of listening, it appears as if some active motor process was taking place in the ear. This probably consists in the simultaneous contraction of the stapedius and tensor tympani muscles, which exert tension on the chain of ossicles in opposite directions. Their function appears to be to regulate the balance of the stapes and so modify the intravestibular pressure that the cochlea may act at its maximal efficiency. The small muscles of the external ear are generally regarded as rudimentary and functionless structures in man. Keith has pointed out that muscles which are never used tend in the course of many generations to disappear. But the muscles of the external ear are invariably found in man, and therefore differ from those rudimentary muscles which have either disappeared altogether or are only found in a minority of human beings. They are, moreover, as well developed in man as in apes. It thus appears probable that they are not as inactive as is generally supposed, and that their activity is not confined to the occasional display of their power by the comparatively small number of individuals who can voluntarily move their ears. How strong the muscles may be was well shown in the case of a soldier who constantly saw in his dreams a

* Lectures I. and II. were published in THE LANCET, July 24th, p. 169, and July 31st, p. 235, respectively.

German whom he had bayoneted in the face; at the same time he developed a bilateral spasm of his face, which recurred every few seconds. Every muscle supplied by the facial nerve was involved, including those of the ear, the movements of which were extraordinarily well marked, although the patient had never been able to move his ears voluntarily. When the dreams disappeared as a result of psychotherapy the spasms also ceased.

On closely watching the ears of a man who was listening intently I found that a definite movement always took place. I have since confirmed this in several individuals. In some cases the outer edge of the auricle moved outwards and forwards on listening to a sound in front, and inwards towards the side of the head on listening to a sound behind. The most vigorous movements I have seen occurred in a man who could move his ear voluntarily, and who was also aware that he moved it when he listened intently. It is, of course, obvious that these movements are mere remnants of the big movements in animals, which have the object of concentrating as many sound waves as possible in the external auditory meatus.

The contraction of the stapedius and tensor tympani might be thought to play a more important part, but careful observations made with W. M. Mollison failed to show the slightest alteration in the process of hearing in complete unilateral facial paralysis, including presumably the stapedius muscle.

When a man is temporarily deafened by a loud noise or by some recoverable disease he finds that he is unable to hear however much he tries, and consequently after a time he gives up trying. That is to say, he ceases to listen, and when the cause of the deafness at last disappears he has become so convinced that he cannot hear that he makes no further attempt to listen. Although the sound vibrations reach his ears in the normal way, they do not give rise to the slightest auditory sensation because of this inattention; he is then suffering from hysterical deafness, the inability to hear having been suggested by the original organic, though temporary, deafness. Severe hysterical deafness developed in a soldier while he was the only Englishman in a German prison. He ceased to pay attention to what was said as he could understand nothing, and in time he ceased even to hear the unintelligible conversation of his companions. His hysterical deafness was rapidly cured by psychotherapy when a year later he came under the care of Major J. F. Venables at the Seale Hayne Hospital.

In hysterical deafness the synapses at one or more of the cell-stations in the auditory path to the cerebral cortex must therefore be unswitched, possibly as a result of retraction of the dentrites. Further evidence for this follows from a study of the auditory motor reflex.

Auditory Motor or Jump Reflex.

A sudden noise normally causes an individual to jump and often to blink, and the pupils dilate; the "jump," at any rate, is a protective reflex and represents the preparation for flight or fight. The blinking cannot be suppressed by the majority of people, although expert revolver shots are said to acquire inhibitory power over it. It is very doubtful, however, whether they ever suppress the pupil reaction.

An officer, whose left motor cortex had been almost completely destroyed, went to the *Man that Stayed at Home* about four months after he was wounded. His right arm jumped violently when the gunshot rang out on the stage, although no trace of voluntary movement returned until three months later. The efferent part of the reflex is thus subcortical. In certain war neuroses of emotional origin, in which the reflex is exaggerated, jumping continues during sleep and deep hypnosis, although the patient does not hear the noise which induces it, even in a dream. The afferent part of the reflex is thus also subcortical, the reflex being quite independent of actual hearing.

Experiments on animals by Sherrington and Forbes[1] confirm the conclusion we reached from clinical observations, that the auditory motor reflex is a function of the mid-brain. They showed that both the posterior corpus quadrigeminum and the medial corpus geniculatum are concerned. The close relation of these centres to the blinking and the sympathetic pupilo-dilator centres in the neighbourhood of the third nerve nucleus, and to the anterior corpus quadrigeminum and red nucleus, in each of which a descending motor tract originates, gives an anatomical basis for this view. In the experiments of Sherrington and Forbes on cats, sounds, especially barks, yowls, and whistles of birds, excited orientatic reflex movements of the pinna and neck after the complete removal of the cerebral hemispheres, striata, and thalamus. Reflex movements expressive of anger and aggression—lashing of the tail with bristling of its hairs, and flexion and extension movements of the limbs—were also produced. In our cases of complete bilateral deafness the auditory motor reflex was completely absent, but returned simultaneously with the restoration of hearing as a result of psychotherapy. A very nervous but totally deaf mute remained completely unmoved, never jumping or showing a flicker of his eyelids during one of the severest thunderstorms I have known, and yet the next day he was completely cured by suggestion under partial anæsthesia.

A slight reflex was present in most cases of severe but incomplete hysterical deafness, but it became less marked, and sometimes disappeared completely, or was confined to a slight dilatation of the pupil when the test was repeated.

The abolition of the auditory motor reflex in absolute hysterical deafness makes it clear that one or more of the unswitched synapses in hysterical deafness must be at the level of the reflex, or still lower in the auditory nucleus or in one of the intermediate cell stations—the superior olive or the nucleus of the lateral fillet, or perhaps in all.

The persistence of the deafness during hypnosis and natural sleep shows that when the inattention of hysterical deafness has lasted for a considerable period, the unswitching of the synapses is more profound than that which normally occurs during deep sleep, in which the synapses can always be forced by a loud noise.

DIAGNOSIS.

In the observations I carried out at Netley with E. A. Peters we found it necessary to discard almost all the criteria formerly used in the diagnosis of organic deafness from deafness due to hysteria or malingering.

History.

Complete bilateral deafness following the explosion of a powerful shell was generally hysterical, though a lesser degree of asymmetrical organic deafness of a more or less permanent nature might be produced at the same time, owing to perforation of the drum or hæmorrhage into the middle ear, both of which were often followed by otitis media or to dislocation of the ossicles. It is still doubtful whether absolute organic deafness ever results from hæmorrhage into the internal ear following aerial concussion, as no anatomical evidence of such an occurrence has yet been forthcoming. Deafness following an acute illness is, at any rate in part, always organic, but we have found that the deafness may be increased as a result of auto-suggestion, no spontaneous improvement in function occurring when the anatomical condition improves.

Other Evidence of Hysteria.

Our investigations have shown that hysterical symptoms may develop in the most normal individuals if the suggestion which provokes the symptoms is sufficiently powerful. No more powerful suggestion of deafness could be imagined than the organic but temporary deafness caused by the noise of an explosion in the immediate neighbourhood. It is therefore not surprising that hysterical deafness has occurred almost as frequently in soldiers, who have no personal or family history of neuroses, as in those with a neuropathic predisposition. Deafness has consequently been the only hysterical symptom in the majority of cases. When, however, the onset was associated with extremely terrifying circumstances, some of the physical results of fear, such as mutism and tremor, were often perpetuated as hysterical symptoms. Thus hysterical deaf-mutism was quite common. In two cases sand was thrown into the patient's eyes from the sand-bags on which the shell exploded, and the hysterical deafness was accompanied by hysterical blindness which followed the conjunctivitis caused by the irritation of the eyes with the sand.

The only conclusion which can be drawn from these facts is that while the association of deafness with mutism or with tremor is very suggestive of hysteria, hysterical deafness occurs most frequently in otherwise normal individuals with no symptoms or history of neuroses.

The Supposed Association of Hysterical Anæsthesia of the External Ear with Hysterical Deafness.

Ever since Briquet[3] in 1859 described the association of hysterical deafness with anæsthesia of the external ear, this has been regarded as an almost constant phenomenon.

J. L. M. Symns, R. Gainsborough, and I[4] noted the sensibility of the external ear in a series of 29 soldiers, all suffering from organic deafness, due to various causes and of varying degrees of severity. The ears were first touched lightly with a finger or some wool, sometimes beginning with the deafer ear, sometimes with the ear which was less deaf or normal; at the same time the patient was asked, "Which side do you feel more distinctly?" A similar comparison was then made between each ear and the cheek on the same side. In 28 out of the 29 cases hearing was distinctly better on one side than the other, and in several the latter was normal; 18 of the 28 had partial anæsthesia, and 4 had hyperæsthesia of the affected ear; the better ear was normal in every case. In the single case in which the deafness was equal in the two ears there was no anæsthesia; but this man did not appreciate that he was deaf at all, a slight degree of deafness having only been discovered when the ears were examined on account of other symptoms. The 6 cases of asymmetrical deafness, in which no anæsthesia or

hyperæsthesia was found at the first examination, were then examined again, but a gross form of suggestion was now employed, the patient being asked the following questions: "You feel my finger less clearly when I touch this ear (the deafer one), than this one, do you not?" and "You feel me touch this ear (the deafer one) less clearly than your cheek, do you not?" Four out of the six patients answered "Yes"; in the remaining two the degree of deafness was very slight. In several of the patients anæsthesia was found to be very well marked, and was associated with complete or partial analgesia. So real was this loss of sensation that one patient was subsequently seen putting a pin through the lobe of his ear for the amusement of the other men in his ward.

In a case of severe bilateral hysterical deafness examined in the same way both ears were found to be completely anæsthetic. In a second case, in which one ear was totally deaf owing to organic disease, and the other had been totally deaf owing to hysteria, but was now only partially deaf as a result of psychotherapy, the organically deaf ear was found to be anæsthetic, and the hysterically deaf ear was normal, corresponding with the fact that the deafness of the former was much more severe than that of the latter.

It is thus clear that the supposed association of hysterical anæsthesia of the external ear with hysterical deafness is a complete fallacy, and that anæsthesia is likely to occur in a deaf ear if looked for, whether the deafness is organic or hysterical, so long as the individual is sufficiently suggestible and not too well educated. Thus in all the above cases the patients were soldiers who had been on active service, and our experience has shown how remarkably suggestible the majority of war-worn soldiers are, even in the absence of any hysterical or other nervous symptoms. The results obtained with ordinary hospital patients was consequently less striking. Among four adult male civilians, three females, and two boys, all of whom were deaf in one ear or deafer in one ear than in the other, only one of the adult males had an anæsthetic external ear. When, however, they were shown two test-tubes, one of which was said to contain hotter water than the other, and were asked to say which side was touched with the hotter tube, eight out of nine said that the deaf (or deafer) ear felt the heat more than the other ear, although in every case the same tube was used for touching both ears.

Ten well-educated individuals who were asked whether they would expect any difference between the sensibility to touch in the two external ears if they were deaf on one side only replied in the negative. On the other hand, seven indifferently educated men all replied in the affirmative. The difference is simply due to the fact that no intelligent man would expect his external ear to be anæsthetic if he were deaf, but a man of less education would act upon the suggestion implied in the question without criticising it. The greater frequency of grotesque hysterical symptoms among hospital than private patients, and among private soldiers than officers, is doubtless due to the greater intelligence and greater development of the critical faculties of the latter.

Bone and Air Conduction.

When deafness is not absolute a tuning-fork can still be heard by bone conduction (positive Rinne's test). This shows that the deafness does not depend on changes in the middle ear, even when these are present. But it does not distinguish between the nerve deafness due to organic disease and that due to hysteria. Moreover, the test can only be applied in the slighter cases, as in many instances deafness is absolute and no hearing is possible, whether the sound is conducted by bone or through the air. The vibration of a tuning-fork held on the mastoid process is, however, often felt, and the aerial vibration caused by very loud noises is occasionally appreciated, even when no sound is heard.

Auditory Motor Reflex.

In absolute deafness, whether due to organic disease or hysteria, the auditory motor reflex is absent. In partial deafness it is present, and from what has already been said on this subject it is clear that the presence of the auditory motor reflex does not necessarily imply that hearing occurs. This is of considerable practical importance, as an examination of the reflex has in the past often been used as a test of severe but not absolute deafness in mute children and in supposed malingerers, although a man who says he can hear hardly anything, but shows a normal reflex, is not necessarily a malingerer, for he may be suffering from genuine hysterical deafness or even organic deafness due to a bilateral lesion of the cortical auditory centres.

Persistence During Sleep; Effect of Hypnosis.

As hysterical symptoms are due to suggestion, it might be expected that they would not persist during sleep, and Babinski regards this as a definite law. My experience agrees with his with regard to all other hysterical symptoms which I have investigated, such as paralysis, contractures, and anæsthesia; I have seen several deaf-mutes and one aphonic who talked naturally in their sleep, and a man with hysterical amnesia had nightmares referring to his period of amnesia. But hysterical deafness, the behaviour of which during sleep does not appear to have been tested by Babinski, is an exception. Thus, greatly to my surprise, I found it quite impossible to wake two of my patients, who were suffering from total hysterical deafness and were sleeping in a hut by themselves, by shouting or by making other very loud noises within a foot of their heads. I convinced myself that deception was impossible, and the hysterical nature of the deafness in both cases was at a later date conclusively proved by their instantaneous recovery with powerful suggestion. In one patient a slight twitch of the eyelids was sometimes observed with a particularly loud noise, but not in the other. It seems probable that a malingerer could be detected by this test, as he would certainly wake if a loud noise was made when he was asleep, whereas in hysterical and organic deafness waking does not follow.

I had expected that hearing would return in hysterical cases during hypnosis, but I found it quite impossible to make the patients whom I had deeply hypnotised obey any command or show any signs of hearing, and no auditory motor reflex was produced. The unswitched synapses thus appear to remain unswitched during hypnosis as they do during sleep.

Character of the Voice; Lip-reading.

In almost all cases of severe deafness due to organic disease the character of the voice changes. It is difficult to understand why there should be any difference in the effect of total deafness on the voice, whether it is organic or hysterical, as the change is simply a result of the patient's inability to hear his own voice. Although in some of our hysterical cases the typical voice of the organically deaf developed, the majority showed no change in timbre or intonation.

When a deaf man teaches himself lip-reading his deafness must be of a high degree. Several patients with hysterical deafness learnt it with remarkable rapidity, so that it cannot be regarded, as has been suggested, as a sign of organic disease. On the other hand, it is very unlikely that a malingerer would ever learn lip-reading.

Vestibular Symptoms and Reactions.

Disturbances in the vestibule as a result of concussion may cause spontaneous nystagmus, which may be accompanied by giddiness and staggering, but these symptoms rarely last for more than a few hours. We have found that the only test upon which almost complete reliance can be placed in the diagnosis of absolute hysterical deafness from absolute organic deafness is the presence of normal vestibular reactions in the former and their loss in the latter. The vestibular reactions are entirely beyond the control of the will, and it is therefore inconceivable that they should disappear as a result of suggestion. As hysterical symptoms are always caused by suggestion, the vestibular reactions must remain unaffected in hysterical deafness. On the other hand, it is highly improbable that any organic lesion could damage the cochlea or the cochlear nerve or nucleus on both sides sufficiently to cause total bilateral deafness without at the same time damaging the vestibules or vestibular nerves or nuclei, so that total organic deafness is almost certain to be accompanied by deficiency in the vestibular reactions. The only exception of which I have heard is a case reported by Fraser[5] of a congenitally deaf man, in which microscopical examination of both inner ears showed that the organ of Corti was so malformed that hearing was almost abolished, while the vestibules were normal. The caloric reaction was noted on both sides some days before death, and a normal response was obtained.

The vestibular test has proved of great value in cases of total deafness. But it must be remembered that in partial organic deafness the vestibular reactions may be lost in severer cases and exaggerated in slighter cases; any hysterical element which may be present in such cases can only be recognised by the improvement which follows psychotherapy. The vestibular reactions may be investigated by the rotation, caloric, or electrical tests, in all of which nystagmus and giddiness occur in normal individuals, but not if the vestibular nerves are damaged. We have employed the rotation test, as it requires no special apparatus, the patient turning rapidly round five times in one direction and subsequently in the opposite direction. The character and degree of the nystagmus on looking in the direction opposite to the rotation is estimated, and the subjective and objective evidence of vertigo is investigated. The rapidity of the movements of the eyes and their duration should be the same when the individual is rotated clockwise or counter-clockwise. If any inequality is observed, one vestibule must be involved and the other spared, or one must be involved more than the other. An equally simple and satisfactory test[6] is for the patient to turn five times round a walking-stick, which he holds in the erect position, with his back bent, so that his forehead rests upon the handle of the stick; he then attempts to walk along a straight line marked on the floor. A normal

individual diverges from the line in the same direction as he has been turning, the angle being equal whether he turns to the right or left, but in severe bilateral vestibular disease he walks straight forward, or if the ears are unequally affected the angle differs according to the direction he turns.

The following remarkable case well illustrates the fallacious character of the criteria which were formerly regarded as sufficient to make an accurate diagnosis possible.

Hysterical total deafness in a man of 18 dating from infancy.—G. C., a deaf-mute, 18 years old, appears to have become deaf after a fall on his head some time between the age of 3 and 9 months. His mother is certain that he could hear as a small baby, although at a later date a number of aurists were consulted, who all stated their belief that this observation must be incorrect and that he must have been deaf from birth. With great difficulty he was taught to speak, but he has the characteristic extremely indistinct speech of a deaf-mute. He does not remember ever having heard anything at all, except on rare occasions during the last few years, when he thinks he has sometimes heard a loud noise, though possibly he really only felt the vibrations of the sound. When I first saw him in May, 1919, he appeared to be totally deaf, but there were no signs of middle-ear disease and the vestibular reactions were perfectly normal. The auditory motor reflex was completely absent. I explained to him by means of lip-reading, at which he is an expert, that he could not hear because he had never tried to listen, and that if he once made an effort to listen he would begin to hear. On this first visit he was taught to listen sufficiently to hear his name called close to his ear; this was the first word he ever remembered having heard. The same day he heard his bicycle bell and a motor horn for the first time. During the course of the next three weeks, in which it was impossible to give him more than an occasional short lesson, he learned to hear a number of words, each of which had to be taught separately, as, although he could hear the sound, it conveyed nothing to him until he realised what the word was by lip-reading. When once learned, he could understand it on a future occasion, but found it extremely difficult to continue to listen for more than a few minutes, so progress was slow. At his best he could hear a familiar word from the other side of the room without the voice being raised, but frequently it was necessary to shout a word into his ear. At the same time, he improved sufficiently to be able to hear all ordinary sounds; he could hear a band and he could hear notes played on the piano, but he had no idea of pitch and could not distinguish one note from another. The auditory motor reflex was now normal. I heard from his father on May 9th, 1920, that he continues to make steady progress. He now almost always looks up at once when anybody speaks, and seems to hear most sounds without any obvious effort.

In this case a young man of 18 had been a deaf-mute from infancy and the many aurists who had seen him in the past regarded his condition as obviously incurable; the complete absence of anything in himself or his relations which could be regarded as pointing to a tendency to neuroses, the absolute loss of bone and air conduction and of the auditory motor reflex, the persistence of deafness during sleep, the characteristic speech of the deaf-mute who has painfully acquired the power of making himself understood, and his great skill as a lip-reader might have been taken to prove beyond the shadow of a doubt that the deafness was organic. But the vestibular reactions were normal, and acting upon this alone we were able to prove the functional nature of the condition by restoring his powers of hearing by means of psychotherapy. The deafness which developed when he was about 3 months old must have been due to some organic but evanescent lesion. It occurred at a period when he was just learning to listen, and consequently interrupted his development in this direction. When the organic cause disappeared he had become unaccustomed to listen, and he never learnt to do so again. The deafness was thus really a product of suggestion, and as it is being cured by psychotherapy it can legitimately be regarded as hysterical.

A proper understanding of the psychological process involved in listening and of the disturbance in the process which results in hysterical deafness should lead to a great improvement in the treatment of the latter. When hysterical deafness is associated with mutism it requires no special treatment, as hearing almost invariably returns spontaneously when speech is restored. In order to make this still more certain the patient must be convinced that directly he speaks he will hear his own voice and that he will then hear everything clearly. There is rarely any difficulty in curing the mutism by simple explanation and persuasion, though in our earlier cases we occasionally resorted to the suggestion produced by applying faradism to the larynx or making the patient excited with an anæsthetic.

Treatment of Uncomplicated Hysterical Deafness.

Uncomplicated hysterical deafness is much more difficult to treat, and for a time our results were less satisfactory than in any other hysterical condition. For this reason we were induced to employ various forms of suggestion, although we realised that the methods were not really satisfactory. Suggestion under hypnosis was never of any use, as the patient remained deaf whilst hypnotised and consequently heard none of the suggestions which were made to him. Electricity as a means of suggestion was sometimes successful but often failed. In a number of cases of absolute bilateral deafness, which had resisted all other forms of treatment for some months, we performed "fake" operations, making a scratch behind the ear in the incompletely anæsthetised patient. I described two cases of this kind with Captain E. A. Peters in THE LANCET in 1917.[2]

This method of treatment was also not invariably successful, and at the best it was not one which could be regarded as desirable, as it is much more satisfactory for the patient to understand the exact means by which he has been cured than for him to be fooled into a cure by gross suggestion. With increased understanding of the psychological basis of hysterical deafness we were able during the last year of the war to cure a large majority of cases by the most rational form of psychotherapy—explanation, persuasion, and re-education. The patient is made to understand by written explanations how he has become deaf and how the original cause of his deafness has now disappeared; as the deafness was at first organic he could not hear, however much he listened, and consequently after a time he ceased to listen at all. He is next persuaded to listen intently, and is taught that listening is just as active a process as moving and requires a conscious effort on his part until it becomes automatic once more.

Even when a man has completely recovered his hearing it may take some time before he becomes accustomed to the new conditions, especially if he has been deaf for a long period. When caught unawares he often fails to hear, though directly he perceives he is being spoken to he listens and can then hear, even with his eyes closed, so that lip-reading cannot help him. In severe cases he may hear the sound of the voice without being able to distinguish what is said. Re-education is finally required in order that the sounds the patient hears, but at first cannot interpret, can be understood, that words which must at first be repeated separately from each other can be used in continuous sentences, and that the voice which must at first be raised can become progressively more quiet. A similar method of re-education can be employed for the many people who are suffering from some incurable form of deafness, who can in this way be taught to make the most of what powers of hearing they still possess.

Hysterical deafness after being struck by lightning; great improvement with psychotherapy nine years later.—Mr. S., aged 55, was struck by lightning in November, 1911, when in New South Wales. His horse was killed under him and he was left for dead by his companion who was riding with him. He was subsequently picked up and carried to a hospital, where he remained unconscious until the sixteenth day. A burn was found extending from the back of his head down the left side of his body to the hip. When he recovered consciousness he found that he had completely lost his hearing, and that his legs and arms were numb and partially paralysed. He slowly regained his power of movement, but continued to feel peculiar sensations in his limbs. The deafness was associated with a continuous noise in his head which reminded him of escaping steam. It was so persistent that it often rendered it difficult for him to get to sleep. When he left hospital he was told that his deafness was due to fracture of the base of the skull caused by the violence with which he struck the ground when he fell from his horse, as bleeding had occurred from his right ear.

When I first saw him in March, 1920, I found that his vestibular reactions were perfectly normal. He could not hear a whisper at all; loud-spoken words were only heard within 2½ inches from the left ear and 1 inch from the right. Low notes were heard better than high ones. There was no paralysis, but he complained of inability to walk more than a short distance, and he was still troubled with unpleasant sensations in his limbs. I could find no evidence of organic disease, and regarded the deafness as probably hysterical in origin. This opinion was confirmed by Mr. W. M. Mollison, who could find no evidence of disease in either ear. I explained to him that the terrific noise of the thunderclap had produced temporary organic deafness, and that this was the last impression he had before he lost consciousness. It was quite impossible that the deafness was due to a fracture of the base of the skull injuring the auditory nerves, as he had been told, as in that case the vestibular nerves would have been involved at the same time.

I explained to him that having once been deafened he had ceased to listen, and that when the temporary changes produced by the noise had disappeared he could hear again, but he had become so impressed by the fact that he was deaf that he had not tried to listen. He at once improved when he realised that in order to hear he had to listen actively. I gave him a few lessons myself, and he then continued to train himself whilst at home in Scotland. On the railway journey he found that he could hear what other people were saying in spite of the noise of the train, although he had never been able to do this before, and when he got home he found he could hear the voices of his relations which he had not heard since the accident. He trained himself to listen to everything that was happening around him, and for the first time since 1911 he could hear the singing of birds, footsteps in his neighbourhood, and clocks striking.

Although in the past it had been impossible for anybody to wake him by noises, he now found that quite slight noises might wake

him in the night, so that whatever the basis of the hysterical deafness might be, it clearly persisted during sleep, but was now no longer present. When I last saw him, on June 16th, he could carry on an ordinary conversation without difficulty. Mr. Mollison found that with the right ear, which had been previously almost totally deaf, he could now hear clearly spoken words at a distance of 18 inches, and with the left ear he could hear quietly spoken words six feet away, and a whisper at one inch. He himself has noticed that when his better ear is stopped he can carry on conversation when words are spoken slowly and clearly. At the same time his general health has greatly improved, and the noises in his head have almost disappeared. Whilst he learnt to give greater attention to sounds, he learnt at the same time to give less attention to sensations coming from his limbs, and consequently the paræsthesia of his limbs gradually disappeared.

Hysterical Hyperacusis.

The nervous individual who has a brisk auditory motor reflex which results in "jumping" at the least sound is familiar in civil life. An exaggeration of this condition was a common symptom in soldiers suffering from all forms of war neurosis which were emotional in origin. In its most marked form the patient jumped violently with sudden sounds, which could hardly be heard at all by an ordinary individual, and louder sounds produced violent universal tremors. The condition persisted during sleep, the patient showing the same exaggerated response to sounds, which did not necessarily wake him, although they generally slept more lightly than they had done before the war. The type of sound which produced this reaction was always one which was in some way reminiscent of shell explosions or other sounds of battle. Many patients realised this quite clearly in their waking state. In one severe case of the kind the patient, when deeply hypnotised, told me that he was always listening for shells, and jumped whenever a sound reminded him of them, although he had been unable to explain the symptom when he was awake.

I have already described the experimental and clinical observations which prove that the auditory motor reflex is a mid-brain phenomenon. I believe that its exaggeration in certain neuroses can be readily explained as a result of a mechanism exactly the reverse of that which leads to its abolition in hysterical deafness. Whereas in hysterical deafness the patient does not listen, a soldier who is in a state of constant terror becomes accustomed to listen for shells with abnormal concentration, and this concentration may persist when he is no longer at the front and no shells are bursting. Instead of the resistance at the synapses in the auditory tract being increased, as in hysterical deafness, it is diminished owing to the extreme degree with which the dendrites are extended. This results in an abnormally brisk auditory motor reflex, and probably also in abnormally acute hearing. We only tested the power of hearing accurately in one patient in whom the jump reflex was excessively developed. Captain E. A. Peters and I found that he could hear sounds at a distance four times as great as the average individual, which means that his power of hearing was 16 times greater than the average, as the intensity of sound diminishes inversely as the square of the distance. His acuity of hearing was most remarkable. Sentences whispered in one corner of a large room so quietly that a group of officers in the centre heard no sound at all were correctly repeated by him, although he was sitting in the opposite corner. The hyperacusis and jump reflex were quite uninfluenced by the administration of 100 gr. of bromide a day, and were only slightly reduced by plugging the ears with plasticine.

The increased resistance at the synapses in hysterical deafness persists during sleep. In the same way the diminished resistance in hyperacusis persists, as the patients wake with unusual ease in response to sounds, and also show a brisk jump reflex even when they do not wake.

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THE NORMAL BASAL METABOLISM IN MAN,

AND ITS RELATION TO THE SIZE OF THE BODY AND AGE, EXPRESSED IN SIMPLE FORMULÆ.

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THE present analysis is entirely concerned with the study of basal metabolism—i.e., the metabolism of the individual during complete muscular repose, where a period of 12 hours had been allowed to elapse since taking the last meal. The communication is necessarily preliminary in its scope. The data which have been analysed are only those in which the metabolism was determined indirectly, by measuring the consumption of oxygen in a given unit of time. The formulæ which I have established have all been derived, both in the case of males and females, from the admirable and carefully conducted series of experiments on basal metabolism by Benedict and his co-workers, and the results obtained by other observers and quoted by him. These formulæ have then been applied to the observations of other investigators in America and elsewhere. In the present communication the metabolism of newborn infants and quite young children up to an age of about 5 years is not considered, because, while there exists a relatively long series of observations upon newborn babies, there are but few observations covering the years 1–5, a gap in our present knowledge which it is hoped will soon be filled in view of its great importance.

The relation between body surface and heat production was already suggested by the French writers, Rameaux and Sarrus, in the late "thirties" of last century. In the early "fifties" Bergmann took up the same line of argument in Germany. Müntz, in France, carried out the first actual experiments definitely relating body surface and metabolism in 1880. When the "body surface" law of metabolism is associated with Rubner's name this has its justification in the fact that he was the first spokesman for this theory to support its claims with sufficiently accurate and numerous determinations. Almost synchronously Richet advanced similar views. To give a detailed account of all the arguments put forward by later investigators for and against the "body surface" law, is beyond the compass of this short note. It is only necessary here to refer to the papers of Benedict and Du Bois and their co-workers, and to emphasise the importance of the work carried out by these investigators. Briefly, Du Bois obtained greater accuracy in calculation, using the "body surface" law, by making allowance for the standing height of the individual (as shown in his body surface height charts), while Benedict and his co-workers declared against the view that metabolism was a function of the surface, and they worked out relationships based on weight, standing height and age, and showed the superiority of this method of calculation for the prediction of the basal metabolism of any given normal individual. The relationships are easily calculated from the tables published by this author.

Before discussing the results of my analysis of the various data on basal metabolism I will here state the formulæ by which I have established the relationships between basal metabolism, body weight, trunk length, circumference of the chest and age, as follows:—

(1) The basal metabolism is a function of the weight and the age, which can be expressed in the formula $\frac{W^n}{C \times A^{0 \cdot 1338}} = K_1$ where the power n is approximately 0·5 and K_1 is a constant. This formula indicates that basal metabolism is *not* a simple function of the body surface.

(2) The relation between basal metabolism and trunk length can be expressed in the formula $\frac{\lambda^n}{C \times A^{0 \cdot 1338}} = K_2$ where the power n is approximately 3/2, though more accurately in males 1·567, in females 1·597, and K_2 is a constant.

(3) The relation between basal metabolism and the circumference of the chest can be expressed in the formula $\frac{Ch^n}{C \times A^{0 \cdot 1333}} = K_3$ where the power is approximately 3/2, though more accurately in males 1·37, in females 1·76, and K_3 is a constant.

In previous communications formulæ have been given expressing the relationships between body weight, trunk length, and the circumference of the chest respectively, as follows:—

(4) $\frac{W^n}{\lambda} = K_4$, where the power n is approximately 1/3, though more accurately in males 0·319, in females 0·313, and the constant K is for males 0·38025, for females 0·36093.

(5) $\frac{W^n}{Ch} = K_5$, where the power n is approximately 1/3, though more accurately in males 0·365, in females 0·284, and the constant K is for males 0·662, for females 0·30213.

In all of the above formulæ W = net body weight in grammes, C = total number of calories produced in 4 hours, A = age in years, λ = trunk length in centimetres, and Ch = the circumference of the chest in centimetres. Instead of making use of the formulæ (2) and (3), it is simpler to make use of the following formula:—

(6) $\frac{W^n}{C \times A^{0 \cdot 1333}} = K_6$, where W = the theoretical weight in grammes calculated by averaging the weights corresponding to the given trunk length and chest measurements, which can be ascertained from the tables[1] already published, in order to save the laborious calculation of these weights.

The importance of formulæ (2), (3), and (6) becomes evident when one is dealing with persons whose weight has become abnormal as a result of disease, for it is obvious that with loss of weight a metabolism which would be definitely abnormal when calculated in relation to the observed weight might be perfectly normal when calculated in relation to the calculated weight, or vice versa. No such interference with the size of the constant K will occur if the metabolism is calculated in relation to the trunk length (2), and only to a small extent if calculated in relation to the circumference of the chest, (3), *or* what amounts to the same thing, if the metabolism is calculated in relation to the weight determined from these two measurements (6). Making use of the detailed data for weight, age, and total calories for 24 hours given in Tables C and D in Harris and Benedict's book for men and women respectively, the following constants have been determined. In the case of the males (Formula (1)) $\frac{\sqrt[2]{W}}{C \times A^{0 \cdot 1333}} = 0 \cdot 1015 = K$. In this case the observations on 16 athletes and 11 vegetarians have been omitted, leaving 109 observations for the determination of the constant. In the case of the females (Formula (1)) $\frac{\sqrt[2]{W}}{C \times A^{0 \cdot 1333}} = 0 \cdot 1127 = K$ derived from the 103 persons examined. If in the case of the males all 136 observations are made use of, the constant becomes 0·1018. In comparing the constants for males and females it is evident that, as also maintained by Benedict and other observers, the average male has a greater metabolism than the average female of the same size and age—namely, about 10 per cent. more than the female. In applying Benedict's tables to other observers' data on persons of greatly varying age, such as children, grown-up, and old persons, one is struck in some cases by the marked discrepancy between predicted and observed calorie values of basal metabolism, while in other cases prediction and observation are extremely close, and on an average the correspondence between prediction and observation is better than can be obtained by using Du Bois's surface height charts. In view of this it was of interest to see not only how close the prediction became, using the formula here given, but also to make comparison between the actual constants obtained, using the data of other observers. For this purpose the following table has been constructed:—

Investigator.	No. of persons investigated.	Description.	Average K using author's formula. $\frac{\sqrt[2]{W}}{C \times A^{0 \cdot 1333}} = K$	Regardless of sign. Average % deviation using formula. $\frac{\sqrt[2]{W}}{C \times A^{0 \cdot 1333}} = 0 \cdot 1015$	Regardless of sign. Average % deviation using Benedict's weight, height, age tables.	± % deviation for each group. Author's formula.	± % deviation for each group. Benedict's weight, height, age tables.
Palmer, Means, and Gamble	8	Men.	0·1037	3·70	4·40	− 2·12	− 4·40
Carpenter, Emmes Hendry, and Roth	31	,,	0·1014	5·94	5·30	+ 0·10	+ 0·46
Magnus Levy and Falk	10	,,	0·1000	5·06	5·27	+ 1·50	+ 3·71
,, ,, ...	5	Old men.	0·1045	9·90	10·36	− 2·87	+ 7·94
,, ,, ...	15	Boys.	0·1007	3·46	15·60	+ 0·79	+ 15·60
*Gephart and Du Bois	5	Men.	0·0989	6·10	7·37	+ 2·63	+ 6·75
Du Bois and Aub	6	Old men.	0·0993	8·20	19·83	+ 2·22	+ 17·80
,, ,, ...	8	Boy scouts.	0·0928	9·49	19·70	+ 9·37	+ 19·70

* In only five observations were the age and standing height given, and comparison therefore possible by Benedict's tables. The per cent. deviation for all seven observations by author's formula = 4·59 per cent.

From the above table it is readily seen how much better the agreement between prediction of metabolism and actual observation is when the author's formula is used than when Benedict's method of calculation is applied to this series of observations by different observers. It is also interesting to note that if the basal metabolism constant had been calculated from the eight series of observations, totalling 88 persons, the average constant would be 0·1004, giving a metabolism only about + 1·1 per cent. greater than the figure obtained from Benedict's and co-workers' observations. If the eight boy scouts of Du Bois and Aub are excluded, for similar reasons as the athletes (greater metabolism) were excluded from Benedict's series of men, the constant is 0·1012, a difference of only + 0·3 per cent., while these series show very marked deviations from his own observations when calculated by Benedict's method. The deviation between observation and calculation for Benedict's own series is, in the case of the males, 5·27 per cent. by the author's formula, 5·33 per cent. by Benedict's method, and 5·65 per cent. by Du Bois's method of calculation. In the case of the women the average per cent. deviations are by the author's formula 6·33 per cent., by Benedict's method 6·36 per cent., and by Du Bois's method 7·53 per cent. respectively. It should be pointed out that the deviations in the case of the author's formula will be considerably reduced if trunk length and chest circumference were considered. The actual data on this point will be published later. From the data available it is to be noted, as already emphasised by Benedict, that athletes have a greater metabolism than persons living a more sedentary life.

Conclusions.

(i.) The formula $\frac{W^n}{C \times A^{0 \cdot 1333}} = K$, where n is approximately 0·5 and K = 0·1015 in males and 0·1127 in

[1] "The Assessment of Physical Fitness by Correlation of Vital Capacity and Certain Measurements of the Body," by Georges Dreyer, in collaboration with G. F. Hanson. Cassell and Co. 1920.

females, expresses the basal metabolism in an extremely satisfactory manner over a wide range of body, size, and age, and indicates that basal metabolism is not a simple function of the body surface.

(ii.) By means of the various formulæ given in this paper it is possible to predict the basal metabolism of a normal person with greater accuracy than by the methods hitherto suggested.

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ON THE SIGNIFICANCE OF BLOOD AND SOLUBLE "ALBUMIN" IN THE STOOLS.

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WHENEVER a lesion of the alimentary canal is suspected an examination of the fæces for blood and for soluble "albumin," provided the tests are adequately controlled, is frequently of immense value in diagnosis and prognosis, and may give useful indications of the progress or otherwise of treatment. This paper gives a few practical points concerning the technique and the value of the tests to the ordinary clinician, who too often wholly associates fæcal examinations with complex chemical analyses only possible in a laboratory.

A. *Methods.* 1. *Blood.*

A reaction for hæmoglobin (or its derivatives) in the fæces is only of value if the diet is strictly controlled. Any possible source of hæmoglobin (e.g., meat) must be excluded; and drugs, especially those containing iron, should be withheld for some days before the test. For this purpose a milk régime is satisfactory and convenient, as the typical canary-yellow colour of the stools corresponding to the diet makes it easy to recognise whether the portion of the stool examined corresponds or not to the régime.

The question of reagents is of importance. The usual tests employed in clinical work are Meyer's (phenolphthalein reagent), Weber's (guaiacum and ozonic ether or hydrogen peroxide), and the benzidine test (either with fæcal emulsion or with a smear on a microscopic slide). A critical examination of these various tests has recently been made by Lyle and Curtmann.[1] They find that the benzidine reaction is unreliable, difficult to control, and too sensitive; that Meyer's phenolphthalein reagent is too sensitive also; and they use a new preparation derived from guaiacum as their reagent for the test.

This criticism is certainly corroborated by clinical experience. Meyer's reagent is altogether too sensitive for the positive diagnosis of an occult hæmorrhage. Its sensitiveness, however, makes a negative reaction of great importance, and enables one to rule out definitely the presence of blood. In practice it is therefore wise first to do the Meyer test,[2] and, if this is positive, to control by Weber's guaiacum test. A diagnosis of occult blood should only be made when the guaiacum test is also positive.

Description of Tests.

Meyer's test.—A small piece of fæces is taken from the middle of the stool of the milk régime and made into a thick suspension by the addition, if necessary, of a little distilled water. Fill a test-tube about a third full with this fæcal suspension, add a third of its volume of glacial acetic acid, mix thoroughly for a few seconds, and boil. Then cool thoroughly under the tap. Add about 5 c.cm. of ether, and mix very thoroughly by inverting the test-tube several times. Set aside to separate. If an emulsion forms the addition of a few drops of alcohol will usually bring about a speedy separation, and the supernatant ether layer can then be pipetted off with a teat pipette into another test-tube. To the ether extract add about 1 c.cm. of Meyer's reagent by means of a clean pipette; then add a few drops of hydrogen peroxide. If blood is present there appears immediately a deep red coloration, spreading down the tube. Only an immediate and quite definite reaction is to be regarded as positive.

Weber's guaiacum test.—An ether extract is made as above. To this add about eight or ten drops of fresh tincture of guaiacum[3] and a similar quantity of hydrogen peroxide. A definitely blue coloration, appearing within two minutes, indicates the presence of blood. A greenish or bluish-green tint is to be regarded as nothing more than "suspicious."

It is wise to do the test daily over a period of several days, as the presence of blood in the stools may be intermittent.

2. *Soluble "Albumin."*[4]

German authors have shown that the presence of soluble "albumin" in the stools is always pathological in the case of adults. Normally, coagulated protein (in the protein residues of the food) may occur in the fæces; soluble "albumins" taken in the food, however, are always digested in the course of a normal "digestive journey." Even the "albumins" of intestinal exudates are digested and absorbed with comparative rapidity, and therefore if any are found in the stools the exudation must be either great in amount or not too remote from the anus. Thus, the reaction for soluble "albumin" is applicable to the fæces of an ordinary diet, though it is wiser to carry it out on the fæces of a milk régime.

The usual technique is as follows:—

Take a piece the size of a large walnut from the middle of the stool to be examined, triturate well with distilled water in a conical specimen glass[5] to make a fairly thin emulsion. If the stool is fluid a certain amount can be put straight into the conical glass. Set aside for at least an hour, and then pour off about 20 c.cm. of the supernatant fluid into a suitable vessel, centrifuge the fluid if possible, and then filter; otherwise filter through filter paper previously wetted and plugged at the point of the cone with a little Kieselguhr. Two or three filtrations will probably be necessary before a clear filtrate results, and the filtration is usually slow if the fluid has not been previously centrifuged.

Take 10 c.cm. of this clear filtrate, add 1 or 2 drops of 1 per cent. acetic acid, and if there is any turbidity cautiously add acid drop by drop until the maximum turbidity develops. Then filter until a clear filtrate results. Take some of the filtrate and boil. A heat coagulum indicates the presence of soluble "albumin."

This test is somewhat tedious, and the optimum acidity for both "neutralisation precipitate" and for heat coagulation is often troublesome to obtain. A modification which simplifies the test, and which I have tried with some convenience in a few cases, is the following:—

Take about 10 c.cm. of a fairly clear filtrate from the original fæcal emulsion and add an equal volume of a saturated solution of ammonium sulphate. Filter. The fluid filters more quickly than by the previous method. It may still be necessary to use a little Kieselguhr. Boil the filtrate, carefully adding 1 per cent. acetic acid drop by drop. A coagulum indicates the presence of soluble "albumin."[6]

B. *Clinical Findings.*

Tests for blood and soluble "albumin" have been carried out upon a series of 156 patients suffering from gastro-intestinal troubles. Not many gastric cases are included; a majority of the cases occurred in a hospital in France, of which unfortunately notes are available only in the intestinal cases. In all the cases the "albumin" was tested for by heat coagulation in the presence of acetic acid.

[1] Lyle, Curtmann, and Marshall: Journ. Biol. Chem., 1914, xix., 445. Lyle and Curtmann: Ibid., 1918, xxxiii., 1.

[2] Meyer's reagent is made up as follows: Phenolphthalein 2 g., anhydrous KOH 20 g., distilled water 100 c.cm. Dissolve and add zinc powder 10 g. Boil. The decoloration should be complete in ten minutes. If not, add cautiously a little zinc powder until decoloration is complete. Filter while hot. Keep in the dark with a little zinc powder in the bottom of the bottle.

[3] Except in laboratories, it is best to keep some guaiacum resin, and make up fresh tincture each time it is needed. This is done by dissolving a small fragment of the resin in 2 or 3 c.cm. of 90 per cent. alcohol.

[4] A more accurate term would be "coagulable protein."

[5] A "Gourmet" egg-beater is most useful for this trituration. It consists of a porcelain cylinder, into which fits the beater—a perforated disc attached at its centre to the end of a long handle.

[6] This modification, suggested to me by Professor Ramsden, lessens the sensitivity of the test by precipitating part of the coagulable protein; but in ordinary clinical work the immense saving in time and trouble probably more than compensates for this.

Summary of Results.

Blood and "Albumin" both Present.	
Acute dysentery (bacillary or amœbic) and "acute enteritis"	26
Chronic gastro-enteritis in old amœbic dysentery cases—	
Amœbæ or cysts found	11 } 13
Not found	2 }
Ulcerative recto-sigmoiditis not included in any of above	2
Chronic diarrhœa (? bacillary dysentery)	2
Rectal carcinoma	2
"Chronic enteritis"	2
Intussusception	2
Subacute dysenteriform enteritis	1
Tuberculous sigmoiditis	1
Tuberculous enteritis	1
Pyloric ulcer	1
Amyloid degeneration of the intestine	1
Blood Present, "Albumin" Absent.	
Chronic colitis (? neoplasm of splenic flexure)	1
Post dysenteric (Shiga) mucous colitis	1
Intestinal dyspepsia in old amœbic dysentery case (no amœbæ nor cysts)	1
Colospasm and chronic colitis	1
Intestinal fermentative dyspepsia	1
Duodenal ulcer	1
Pyloric ulcer	1
*Blood Absent, "Albumin" Present.**	
Sprue	1
(? tuberculous) intestinal dyspepsia and chronic colitis	1
Rectal carcinoma	1
Blood and "Albumin" both Absent.	
Hyperchlorhydria	4
Pancreatic insufficiency (primary or secondary)	[illegible]
Post-dysenteric intestinal dyspepsia (bacillary or amœbic)	11
"Acute enteritis"	6
Convalescence from acute dysenteriform enteritis	4
Colospasm and mucorrhœa	4
Intestinal adhesions or kinks	8
Intestinal dyspepsia	8
Obstinate constipation	4
Chronic diarrhœa	3
Chronic appendicitis	2
Chronic (mucous) colitis	15
Chronic cholecystitis or gall-stones	14
Mesenteric hydatid cyst	1

* Several of the acute dysenteries of the first section under treatment arrived at a stage where they had lost a positive blood reaction, while retaining a positive reaction for albumin.

C. *Discussion.*

The significance of the finding of blood in the fæces is generally known, and little need be said here on the subject. The bleeding may have occurred at any part of the alimentary tract, and in this connexion it is important to remember that patients who use hard toothbrushes or who have a habit of sucking their gums often give the reaction for occult blood in their stools.

Another point of importance is that not all "tarry" stools indicate melæna. A stool of mucous colitis, where the mucus is intimately mixed with the fæces and coloured black with bismuth, may give the typical appearance of "melæna." Again, the intense putrefaction which occurs in certain cases of colitis may give an almost black stool, though no blood is present. On the other hand, in the canary-yellow stool of a milk régime quite appreciable amounts of blood may be distributed through it without altering the colour.

It is obvious that blood in any considerable quantity will give the reaction for soluble "albumin," unless the bleeding occurs so high up in the gut that the "albumin" is digested and absorbed before it appears in the motions. Hence the association of both "albumin" and blood in most cases which involved bleeding in the large intestine.

Soluble "albumin."—A positive reaction for soluble "albumin" is comparatively rare in any ordinary series of gastro-intestinal cases. Marcel Labbé[7] found it present in one-sixth of the cases in a series of 113 gastro-enteropaths. Goiffon[8] also found it an infrequent symptom. In this series it occurs in about one-third of the cases, the high percentage being due to the inclusion of many cases of acute dysentery from an epidemic occurring at the time. In ordinary hospital practice it is present in 7 to 10 per cent. of stools sent to our laboratory for investigation. Triboulet, Goiffon, and Labbé all found that it only occurs in grave lesions, ulcerative, inflammatory, or neoplastic, of the digestive tube; and an analysis of the cases in this series suggests the same conclusion.

In the patient with amyloid degeneration of the intestines it would appear that the presence of "albumin" was due to failure of digestion and absorption of the soluble "albumins" of the food. It could hardly be due to hurrying on of the ingested food through the gut, as "albumin" is normally absent even after violent purgatives—an interesting point which Labbé develops when he shows that the presence in the fæces of undigested foodstuffs, especially muscle fibres, without soluble "albumin," may indicate an accelerated "digestive journey"; but if in addition to undigested foodstuffs soluble "albumin" is present there is some grave lesion of the digestive tube, such as occurred, for example, in one of the patients above, who had a mucous colitis associated with a digestive insufficiency secondary to tuberculous enteritis.

In the other cases in which both *blood and "albumin"* were present there was either bleeding or ulceration, or both, of the intestinal tract. Apart from two cases of intussusception, three of chronic enteritis (one tuberculous), and one case of a large eroding pyloric ulcer, these were patients in whom the large intestine was involved, and in many of them definite recto-sigmoidal ulceration was seen by recto-sigmoidoscopy.

Blood present, "albumin" absent (7 cases).—In such cases either the bleeding is small, if it be in the large intestine and there is no serious ulceration, or it is far enough away from the anus for the blood "albumins" to be digested and absorbed, as, for example, in cases of pyloric and duodenal ulcers.[9]

Blood absent, "albumin" present (3 cases).—In the case of sprue, the food "albumins" are probably neither digested nor absorbed. The second case was a probable tuberculous enteritis, and the third a rectal carcinoma. Here there was no bleeding, but a sero-albuminous exudation from the ulcerated surface. In addition to these, it was possible in some of the cases of acute dysentery, especially the amœbic dysenteries, to follow their progress under treatment both by means of the investigation of their stools and by direct examination by the recto-sigmoidoscope.

In the acute stage there was marked inflammation, going on to ulceration and hæmorrhage, with "albumin" and blood present. As improvement occurred, the bleeding ceased, leaving still a serous exudation from the ulcerated intestinal wall. Now "albumin" only was present, blood absent; and at the same time the corresponding changes in the ulcers themselves were followed from day to day by the recto-sigmoidoscope. A similar process of exudation without bleeding may occur in rectal carcinoma.

Both "albumin" and blood absent (92 cases).—In the great majority it would appear that there was a disturbance of function rather than any actual ulcerative lesion. Even in the cases of acute enteritis in this section it was specially noted that the general condition was well maintained, and this in spite of there being 20 stools a day in some of the cases. The toxæmia so typical of acute ulcerative conditions of the bowel was absent. Some of the patients in this section were treated for acute conditions such as bacillary dysentery, recovered, and months later came into hospital, free now from any evidence of ulceration of the gut, but suffering from extremely persistent functional troubles,[10] dependent perhaps upon extensive changes in the mucosa, or maybe in the intestinal nerve plexuses, as Loeper has suggested.[11] In such cases blood and "albumin" are consistently absent.

Position of Lesion.

The finding of blood or "albumin" in the stools does not afford definite evidence of the position of the lesion, and a further simple procedure may show whether it is in the large intestine or not.

The bowel is well emptied by means of an enema, and half an hour later the large intestine is given a lavage of about a litre of normal saline, introduced at body-heat. In acute cases, or in certain recto-sigmoidal ulcerations, a lavage of even 500 c.cm. may be more than sufficient to cause intense pain, and one must be guided by the patient's toleration in deciding how much fluid to introduce. The lavage must be given slowly and at a very small positive pressure, and must be retained as long as possible, up to a period of half an hour. On the fairly clear fluid so obtained the tests for blood and "albumin" are carried out. (The cytology of a centrifuged specimen of the fluid is investigated at the same time.)

[7] Labbé and Canat: Presse Médicale, Sept. 26th, 1918.
[8] Goiffon: Presse Médicale, May 2nd, 1918.

[9] In cases where there is slight bleeding in the large intestine it is possible that a positive blood and a negative "albumin" test may be given because the test for blood is the more sensitive.
[10] Joltrain, Baufle, and Coope: THE LANCET, May 31st, 1919, p. 933.
[11] Loeper: Journ. Méd. Français, November, 1919.

In this way light may be thrown upon the condition of the large intestine.

Conclusions.

1. Examinations of fæces for blood are fallacious unless previous dieting and drugs have been suitably regulated.
2. The test for soluble "albumin" in the fæces is probably even more important than that for blood (though both taken together are specially valuable); it indicates either failure of digestion and absorption of food "albumin" (a very rare condition), or the existence either of hæmorrhage or ulceration of the gut. It is almost always associated with some serious condition.
3. The presence of both "albumin" and blood in the stools indicates (*a*) hæmorrhage with or without ulceration not very remote from the anus, or (*b*) a severe hæmorrhage higher up the gut.
4. The presence of blood alone indicates hæmorrhage. The nearer the bleeding is to the anus, the less significance it has.
5. The presence of "albumin" alone usually indicates serous exudation, without bleeding, probably near the anus, and presumably the further the lesion from the anus, the larger the exudation must have been. More rarely it indicates a failure of digestion and to absorption of food "albumins."
6. Lavage of the large intestine, and investigation of the fluid so obtained, often gives valuable help in localising a gastro-intestinal lesion.

OBSERVATIONS ON
TWO ACTIONS OF ALCOHOL.

BY W. BURRIDGE, M.A., M.B., B.CH. OXF.

THE older physicians prescribed alcohol without misgivings, and never found cause to doubt they were doing what was best for their patients. But their course of action has not hitherto been justified by experiments conducted in the laboratory, so that the modern physicians of necessity prescribe alcohol with an element of uncertainty. Any observations assisting them should therefore be of practical value.

Limitations of Previous Experimental Methods.

As a preliminary some possible limitations to the usual experimental method may be considered. One aim in experimental work is to obtain fixed conditions which, in the case of the heart, means perfusing that organ with some modification of Ringer's solution. The inquirer who went into any laboratory where such experiments were in progress would find the experimenter using the best possible solution for the work, and using only that solution. If he pursued his inquiries further he would find different experimenters using different "best" solutions, but each always keeping to that one he thinks best. If the action of a drug be the same under all conditions an experiment conducted under fixed conditions will give accurate and correct general results. But if the expression of the action of a drug differs under different experimental conditions, an experiment conducted under fixed conditions will give only particular results. I have found that the expression of the action of alcohol definitely differs under different experimental conditions. This is especially the case when small amounts of the substance are used. Under the usual laboratory conditions alcohol in small amounts acts, if at all, as a depressant. But under different conditions it definitely augments cardiac activity.

We will consider first the action of 40 per cent. alcohol on the frog's heart. This strength is well outside the limits employed by any other experimenter, and more than one physiologist has come to me in the laboratory and expressed doubts as to the capacity of a heart to survive exposure to it. With the alcohol and the heart at hand there was no difficulty in making a convert. When I used it first I had no doubt I was using a cardiac depressant, and also that it ought to damage the heart. But certain of the facts observed did not fall directly under those headings. The heart stopped in a more or less contracted condition, and after removal of the alcohol the beats were greater in amplitude than they had been before. To bring that increase of contraction within the scope of a theory of damage or depression was difficult, but it was done.[1] Such a theory, however, cannot include the additional facts following. A heart was used for experiments on the variations in the refractory period produced by this strength of alcohol. It was briefly exposed to the drug and then the disturbance so set up examined. When that disturbance had subsided the heart was briefly exposed to the alcohol again, and so a fresh disturbance set up. Thirty such disturbances were set up and the experiments lasted over two working days. On the third day the heart was still capable of activity though evidently failing. On the fourth day activity was still possible, but later ceased. The point for consideration about these experiments is that no simply perfused frog's heart has survived so long. These facts cannot be brought within the scope of a theory that the alcohol was only a depressant or that it did damage, but on the contrary. After that result one naturally turned to a re-examination of the older records showing the augmentation after the alcohol. The re-examination was greatly assisted by the discovery of a method for ascertaining the maximum contractility of the hearts on which the older experiments had been made. It was thereby found that the old experiments had been performed on hearts that were beating nearly at their maximum. They had little scope for expressing augmentation as improved contraction only, but they showed all they could. In this connexion it is as well to point out that experimenters do not in general know the capacity of the hearts on which they work. It is assumed, but not known, that the heart beats well at the start and that a deviation from that in one direction means better, and in another worse. When the maximum contraction is known it is also known whether a good or bad start was made, whether a heart is beating well or bad at a given moment and by how much, and also the activity becomes directly comparable with that of another heart.

A New Method of Approach.

Having thereby found that the hearts on which the original experiments were made had little scope for showing an augmentation of contraction, attempts were made to give that scope. Instead of letting the cardiac machine run approximately "all out," measures were taken to run the machine at about half power. Then an apparently different result was obtained. Instead of observing a *slight* increase of contraction after the heart had been treated with the alcohol a *great* increase was observed—as much as 100 per cent. The differences depended on possibilities. For if the machine at the start were running at 90 per cent. of its maximum, an approximately 11 per cent. increase reaches that maximum. But if at the start it were running at 50 per cent. of its maximum, a 100 per cent. increase on this reached the maximum. After treatment with 40 per cent. alcohol the heart beats at its maximum. If it were beating at 90 per cent. to begin with only 11 per cent. could thereby be added; if it were beating at 50 per cent. at the start that amplitude could be doubled, and was. In presence of the alcohol the action observed was primarily that of depression. The heart stopped and became electrically inexcitable. It stopped in a more or less contracted condition, that contracture being the only visible evidence of any augmentation at this stage. After washing away the alcohol its depression went also, and it was after this that augmentation was definitely manifest. The underlying cardiac change developed by the alcohol, and responsible for this augmentation of contraction, persisted after removal of the alcohol from the heart. It was a slowly subsiding change, and in about 20 minutes or so the heart returned to the *status quo ante*. This strength of alcohol, then, exerts two definite actions on the heart.

There is a depressing action coming on and going away concomitantly with the drug; there is an augmenting

action showing a capacity for persistence after removal of its producer. The finding of that augmentation was entirely contrary to my expectations. When alcohol was first pushed in this manner it was done with a view to obtaining an advanced grade of depression. The depression was obtained, of course, but it was also found to be always accompanied by an advanced grade of augmentation. The two changes had different modes of subsidence which made possible their separation and identification. Having thus found that 40 per cent. alcohol *always* produced two cardiac changes, the hearts were thereafter exposed to gradually lessened strengths of the drug. Except as mentioned below, the same two actions were found. There was a depressing action coming and going concomitantly with the alcohol, there was an augmenting action showing that capacity for persistence. But on making comparison between the members of the series of experiments carried out with concentrations of alcohol varying from 0·5 per cent. to 40 per cent. there could be appreciated the existence of a definite time factor in the development of the stimulating action. The rate of development increased as the strength of alcohol was increased. With 40 per cent. alcohol a high grade of augmentation was produced in a few seconds; with 1 per cent. alcohol a lesser grade took many minutes. No such differences were observed in the rate of subsidence of the change, once it had been produced. This stimulating action of alcohol in low concentrations has been observed by W. E. Dixon[3] and F. Ransom,[4] but its significance missed. The former though the alcohol was being metabolised, the latter that the heart was acquiring "tolerance." I do not think Dixon would suggest the phenomena observed after 40 per cent. alcohol were a result of metabolism or Ransom that they were acquired tolerance. But those phenomena are only a higher grade of the phenomena they observed and so described. Neither of these observers noted the capacity for persistence of this change, nor that when it was present the cardiac refractory period was shortened.

Profound Influence of Two Factors.

The action on the heart of low concentrations of alcohol is, however, profoundly influenced by two factors not taken into account by other experimenters. The factors modifying this action are: (1) The calcium content of the perfusing solution; (2) the amplitude at which the heart is beating. When hearts beat nearly at their maximum and were perfused with a solution of relatively high calcium content—the normal laboratory conditions—small doses of alcohol (2 per cent. or less) either exerted no appreciable action or only depressed—e.g., 1 per cent. alcohol had no appreciable action, 2 per cent. slightly depressed. When hearts beat at about half their maximum and were perfused with a solution of relatively low calcium content so little as 0·5 per cent. alcohol markedly influenced cardiac activity. There was a definite though small depressing action, succeeded by an augmentation much greater than that original depression; 1 per cent. alcohol gave as much as 100 per cent. increase. Under differing experimental conditions the action of alcohol thus also differed. Those giving a positive result had obviously the greater value. Under these latter conditions the action of 0·5 per cent. alcohol differs only quantitatively from that of 40 per cent., whereas under the others there is also a qualitative difference. Calcium is chiefly responsible for the differences.[2] This element exerts two actions on the heart. Before alcohol can depress it has to overcome the one action of calcium; and before it can augment it has to overcome the other. The more the calcium in the perfusing solution the less readily does the heart react to alcohol.[2] Ringer's solution has a greater calcium tension than has blood, the latter containing substances such as adrenin, which enable the heart to function in presence of much less calcium than would otherwise be necessary. This greater calcium tension of Ringer's solution confers on the perfused heart a lessened capacity for change which, unless taken into consideration, can vitiate the conclusions drawn from our experiments. It can directly alter the expression of the action of a drug. The normal heart is bathed in a solution of low calcium tension. If, in addition, it beats at less than its maximum we have the combination of circumstances under which small amounts of alcohol exert a stimulating action far greater than their concomitant depression. Those who employed it directly under those conditions are justified. But alcohol is a substance that cannot be pushed because its depressing action increases more rapidly than the augmenting. It is only when the drug is used in small concentration that augmentation outweighs depression. Those who prescribe repeated small doses do right.

Summary.

1. Alcohol exerts two actions on the heart: (*a*) A depressing action coming on and disappearing concomitantly with the drug; (*b*) an augmenting action showing a variable rate of development depending on concentration, and especially a capacity for persistence after removal of its producer.

2. With increase of concentration the two actions do not increase at equal rates, depression increasing faster than augmentation.

3. Low concentrations of alcohol under the experimental conditions specified exert a stimulating action far greater than their concomitant depression.

References.

1. Burridge: Quart. Journ. of Exp. Physiol., p. 145, 1913.
2. Burridge: Quart. Journ. of Med., x., p. 141, 1917.
3. W. E. Dixon: Journ. of Physiol., xxxviii., p. 346, 1907.
4. F. Ransom: Ibid., liii., p. 141, 1919.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE ILLUSTRATING

RE-FORMATION OF ELBOW-JOINT

AFTER GUNSHOT FRACTURE AND EXTENSIVE LOSS OF BONE.

BY WINIFRED F. BUCKLEY, O.B.E., M.R.C.S. ENG.,
LATE RESIDENT MEDICAL OFFICER, ENDELL-STREET MILITARY HOSPITAL.

I HAVE recently followed the whole history of a case in which, after gunshot injury of the left elbow-joint with fracture of the humerus and extensive loss of bone, the joint was ultimately re-formed. The notes are briefly as follows.

Private S., aged 38, was wounded on July 23rd, 1916, and admitted to the Endell-street Military Hospital on August 16th. On admission he had very septic gunshot wounds of the left elbow-joint with much swelling and œdema. The X ray plate showed a supracondylar fracture of the humerus with the lower fragment projecting obliquely forwards, its articular surface being dislocated from the head of the olecranon and radius.

On August 29th an operation was performed for the removal of the separated lower end of the humerus which was located in the joint. The inflammation did not subside for three months and there was very little movement of the joint on his discharge in December, 1916.

As he continued to attend at the out-patient pensioners' department, we were able to take a series of X ray plates, here reproduced, of the joint over a period of three years, and these are remarkably interesting in showing a steady growth downwards of the lower end of the humerus towards the ulna and an actual re-formation of the joint, with hardening and rounding off of the lower end of the humerus on the inner side to fit into the cavity of the ulna. The downward growth of bone continued for two years, the new joint forming during the third year.

The photograph shows the patient's present range of movement. The left arm is two inches shorter than the right, the forearm is fixed in a position of semi-pronation, and there is some weakness of the muscles supplied by the musculo-spiral nerve which is improving under treatment. Otherwise good muscular power is present.

Illustrating Dr. Winifred F. Buckley's Case of Re-formation of Elbow-joint.

FIG. 1.

Gunshot wound of the left elbow; radiogram taken on Sept. 18th, 1916, showing the condition after removal of the lower end of the fractured humerus.

FIG. 3.

Radiogram taken on June 23rd, 1919, showing re-formation of elbow-joint.

FIG. 2.

Radiogram taken on Jan. 19th, 1918, showing downgrowth of the humerus towards the ulna.

FIG. 4.

Photograph taken on August 10th, 1919, to show range of movement at elbow-joint; the tracing is made from a second photograph superimposed on the first.

EPILEPTIFORM FITS AND COMA IN SYPHILIS.

BY C. H. SAVORY, B.A. CANTAB., M.R.C.S. ENG.

WITH reference to the recent discussions upon this subject and the article by Surgeon Lieutenant-Commander F. G. Hitch in THE LANCET,[1] the following notes may be of some interest. They all came under my notice between November, 1918, and May, 1919.

CASE 1.—A. B., Private, R.M.L.I., aged 25, contracted syphilis in April, 1918. Wassermann ++++. Treatment consisted of galyl, nine injections, 0·3 g. each, and mercurial inunctions—ung. hydrarg. ʒi. daily. He had had no active signs for six months, but on 10/12/18 he had two typical "epileptiform" fits at 6 A.M. and 10.30 A.M., the latter of which I witnessed. Clinically, it was a typical epileptic fit. But there was no history of previous fits or family history of epilepsy, neither was there any premonitory symptoms or aura. Bromides were administered, but in spite of this the patient had two more fits.

17/12/18: Wassermann was +++, and it was then suspected that the fits might possibly be specific. Bromides were stopped and large and increasing doses of pot. iodide administered, which resulted in a rapid improvement, headaches being the only symptom. In three weeks there were no symptoms, and another course of six galyls was given with no reaction in any case.

28/1/19: Patient was discharged to duty with no symptoms, and apparently fit in every way.

CASE 2.—C. D., aged 27, leading stoker, contracted syphilis in December, 1918.

6/12/18: Wassermann +++. Treatment consisted of three galyls (0·25 g.) and ung. hydrarg. ʒi. daily as inunctions.

17/12/18: Three typical "epileptic" fits in four hours. No previous or family history of epilepsy. No aura to fits. After the fits there was intense headache and the patient was very dazed and drowsy, lethargic, and torpid.

18/12/18: Lumbar puncture performed and 15 c.cm. fluid withdrawn under very increased pressure. Pot. iod. administered in large and increasing doses.

Result.—Complete recovery in three days and interrupted galyl course was resumed in seven days. Examination of C.-S.F. showed: Wassermann, negative; cells, none seen; globulin, absent.

CASE 3.—E. F., aged 19, Private, R.M.L.I., contracted syphilis in September, 1918.

Treatment.—Four galyls (0·25 g.), fourth being given on 18/2/19.

19/2/19: Fifteen hours after galyl patient had three consecutive fits in 40 minutes, and hyoscine hydrobrom., gr. 1/200, was given hypodermically owing to their severity. No history of family or previous fits. After fits condition very torpid, dull, and dazed, and acute headache. Lumbar puncture performed immediately, and 10 c.cm. fluid withdrawn under increased pressure. Examination of fluid showed: Wassermann, negative; cells, none seen; globulin, not present. Wassermann of blood +++. In 48 hours complete recovery, and fifth and sixth galyls were given on 25/2/19 and 4/3/19, with no reaction in either case.

CASE 4.—G. H., aged 40, A.B., contracted syphilis in 1909.

Treatment.—Three "606" and two years intermittently with mercury. No treatment since 1911. Admitted with gumma of inner end of left clavicle and a history of fits in last six months, tinnitus, headache, and of being "strange in his manner." Pot. iod. and galyl were given and the gumma cleared up.

24/1/19: Lumbar puncture performed and about 25 c.cm. fluid withdrawn under very marked increased pressure. Relief was apparent in 24 hours.

29/1/19: He was discharged to duty with no symptoms, and his manner and behaviour were markedly brighter and more alert. In this case I witnessed no fits, but there was a definite history of them and no epileptic history. C.-S.F. examination was again normal, with Wassermann negative; Wassermann of blood being ++++. Urine normal.

Conclusions.

These cases give rise to the following possibilities:—

1. Epileptiform fits in syphilis may not be so uncommon as is commonly thought, and may be an early manifestation.

2. Cases of "epilepsy" suddenly occurring in adults, when there is no previous or family history of epilepsy, might with advantage be investigated for syphilis.

I should like to emphasise the rapid relief apparent after early lumbar puncture and allowing cerebro-spinal fluid to come away until it flowed at a normal rate. Pot. iod. also appeared to assist matters very considerably.

[1] THE LANCET, 1920, i., 1311.

OPIUM IN ACUTE DILATATION OF THE HEART.

BY JAMES T. R. DAVISON, M.D.

IN the following case of aortic regurgitation compensation had been established for several years, but was temporarily lost owing to an extraordinary physical effort. The patient's condition was made worse by taking a glass of milk when in an acutely exhausted state. As a consequence the myocardium gave way and extreme dilatation supervened.

Margaret G., 20 years of age, had rheumatic fever five years ago. When at school her companions had noticed that, on running, an episternal pulsation appeared on her neck. She had never suffered from fatigue but occasionally from palpitation.

On Jan. 24th of this year, being at the seaside, she rapidly ascended 140 steps in a lighthouse. She became very tired, and on the way to the hotel drank a glass of milk. On arriving at the hotel she was seized with an attack of palpitation, accompanied by a feeling of extreme prostration. Next day the temperature rose to 102° F.; the pulse became so quick that it could not be counted. The temperature descended somewhat later on, but the prostration and rapidity of the pulse remained as before. Hypodermic injections of camphorated oil, digitalin, and oxygen inhalations were administered. As she continued in the same state for three days she was brought by train to Buenos Aires. I saw her at midday on the 28th, and found her in a state of extreme prostration. She had air hunger; the pulse was regular, over 200 per minute; enormous dullness over the heart; cardiac impulse extended outside the mammillary line; coughed slightly, and had had a little hæmoptysis in the morning. I gave her a hypodermic injection of camphorated oil. At midnight no change; another injection of oil, and 15 drops of digalen by the mouth. Next morning I found her in the same condition; the day before she had taken a small glass of milk, which had caused a great deal of pain and discomfort; she had not slept for several days. Her state was now very alarming, and as her heart might become exhausted at any moment and cease to contract I determined to administer a hypodermic injection of one-fifth of a grain of omnopon (a remedy which contains all the essentials of opium); at the same time I gave her another injection of camphorated oil and 15 drops of digalen by the mouth. As food she was only allowed sugared water and weak broth. I saw her again in the afternoon and found that she had slept three hours and the pulse had come down from 224 to 210. I gave more digalen and another injection of oil. At midnight I found her completely changed. The pulse had dropped from 210 to 110; she had slept several hours and felt quite happy and contented. Another injection of camphorated oil was administered. On my visit the next morning the report was that she had slept all night. On examining her heart I heard a diastolic murmur in all the areas, with maximum intensity over the upper part of the sternum; a systolic murmur all over the sternum. A later examination of the urine revealed the presence of albumin and of hyaline casts.

Remarks.

In this case the strain on the heart involved in the great effort of ascending rapidly a heavy flight of steps had weakened the myocardium. As a consequence the sympathetic had come to the rescue, and by accelerating the cardiac contractions had essayed to neutralise the depressing effects of the weakened muscle. But, as sometimes happens in the working of the mechanisms designed to direct and protect the organ, the parts are not always well adjusted, and the effects, far from saving the organ, may actually lead to its death. Since opium is supposed to hinder somewhat the synapsis between neurons, I administered omnopon in the hope of separating the corresponding neurons, and thus impede too rapid passage of nerve force along the fibrils.

I tried to give the heart absolute rest so that the myocardium might recuperate its vigour, and so I recommended the patient to remain in bed for a long time. As she felt so well she would not take my advice and got up and went about as usual. I essayed at first to reduce the rapidity of the contractions by means of digitalin, but I soon gave up the treatment, having obtained no practical results; besides that I am loth to interfere directly with the myocardium unless there is rupture of compensation. I preferred to strengthen the heart indirectly by administering arsenic and hypophosphites. I must add that after a time the cardiac dullness was much reduced. I saw this patient three months afterwards and she reported that she felt as well as she ever had done before her sudden illness and that her pulse ranged between 80 and 90.

Buenos Aires.

A SITE near Nel's Poort, Cape Province, is being selected for the contemplated Cape Provincial tuberculosis colony. It is stated to possess all the requisite advantages for such a settlement.

NATIONAL HOSPITAL, QUEEN-SQUARE, LONDON.—Thanks to an emergency grant of £4000 from King Edward's Hospital Fund for London and an extension of the principle of payment by patients, the hospital is again able to maintain the greater part of the work of the institution. It was feared at one time that the whole of the hospital would have to be closed; this catastrophe has been averted, but three wards nevertheless remain unoccupied pending the receipt of increased monetary assistance.

Reviews and Notices of Books.

THE INDUSTRIAL CLINIC.

A Handbook Dealing with Health in Work. By Several Writers. Edited by EDGAR L. COLLIS, M.D. Oxon., M.R.C.P., Talbot Professor of Preventive Medicine in the University of Wales. London: John Bale, Sons, and Danielsson, Ltd. 1920. Pp. 240. 10*s*. 6*d*.

THE appearance of this book is an indication of a growing interest in preventive medicine, which some years ago touched the individual at few points only, but whose influence now begins with, or even before, birth and is continued to the grave. A realisation of the place which industrial medicine should occupy in industrial administration has been quickened by the experiences of the last few years; but success in its application depends to a great extent upon the benevolence of the worker, and this benevolence will hardly be accorded until the worker is sufficiently educated to appreciate its importance, an event that may be regarded as one of the benefits to be expected from an advance of true education. Educational policy has not always gone along lines calculated to promote such appreciation. Instruction has often taken the place of education, and not infrequently imagination has been killed instead of being stimulated. In the future the one result will be gained or the other, according to the type of teacher chosen. In the past the teacher of youth has often been a man not only himself incapable of teaching but incapable of learning also.

In the present volume we find grouped a series of contributions from men who have devoted years to their subjects or who have been drawn towards them by recent necessities, and have entirely different outlooks. The first chapter is contributed by Dr. W. F. Dearden, certifying surgeon for Manchester and medical officer of health for the Port of Manchester. This forms an excellent introduction to the medical examination of the worker, and pays especial attention to the examination required for the granting of certificates of fitness for factory workers under 16 years of age and the examination of all workers required by special rules or regulations governing dangerous industries. The material is plainly put forward, and is the result of ripe experience. Those who have had opportunities of observation similar to those of Dr. Dearden will agree with many of his strictures—e.g., upon the sanitary accommodation in many factories—and can only regret that the comment that "the surgeon can do nothing practical towards ameliorating unsatisfactory conditions" is still true. The same may be said of the statement that in the case of personal hygiene "the surgeon can do nothing beyond giving good advice."

The second chapter is written by B. Muscio, M.A., and it is a sign of the times to find a psychologist collaborating in the production of a book on medicine. The subject treated, "Choosing the Worker," has a greater importance in medicine than is yet realised; the degree to which a worker fits his environment may be determined largely by selection, while environment in its turn has much to do with his efficiency. No doubt the health of the working population will be vastly improved when periodic examination—psychological and medical—makes it impossible for a worker to remain unknowingly in an occupation for which he is unfitted.

Chapter III., on Industrial Efficiency and Fatigue, has been entrusted to Dr. H. M. Vernon, who is now an investigator to the Fatigue Research Board. This is one of the most difficult sections of the book. The subject is little understood, and, whilst a scientific treatment is demanded, no satisfactory definition of the condition itself is as yet universally accepted. A similar uncertainty may be said to exist with regard to the tests to be used. Dr. Vernon says: "The identification and measurement of the condition of industrial fatigue is by no means an easy one, and the most reliable test at present available is that of output." Everyone will recognise the difficulty referred to in the first part of this sentence; those best qualified to judge will perhaps hesitate to accept the statement contained in the second. To measure the condition of a couple of workers with regard to industrial fatigue and to compare the two is very difficult; but to compare the condition of the same worker with regard to industrial fatigue at different times is comparatively easy, though the test employed would not as a rule be that of output, for this is much influenced by circumstances beyond control and often becomes entirely unreliable. Dr. Vernon truly says, "It by no means follows that a fall of output necessarily implies the existence of fatigue." Conversely, it by no means follows that fatigue is absent when output is maintained. It may be true, as Dr. Vernon states, that, where repetition work was the rule, such conditions as character of the article made, quality of material, nature and speed of machinery remained absolutely unchanged for two years or more; but it can hardly have been strictly true that "the only alteration of conditions was in the hours of labour." There are conditions of importance besides those mentioned, some of which could scarcely have remained unchanged for the time described. The difficulty of making an accurate determination of industrial fatigue with the methods at present available is very great, but this fact ought to make us all the more careful in excluding every possible source of error. The statement that output is the most reliable test of fatigue has been made previously, but instances given in this article lend little support to such a view. Remarks on the avoidance of industrial fatigue, the length of the working day, overtime, and length of spells, may be commended, though one feels that here is an attempt to treat an extensive subject in an altogether inadequate space, and the object of the particular type of book we are dealing with has been missed. It is to be hoped that more ample space will be allocated to these subjects in the future.

With regard to time and motion study it is true that the former originated with Dr. F. Taylor, but motion study in the fullest sense originated with Gilbreth. Gilbreth's name is mentioned in connexion with the comfort of the worker, and his "fatigue study" is referred to in the literature, but no reference is made to him as the great exponent of motion study, in which he has worked so long, and upon which so much of his reputation rests. Dr. Vernon believes that time and motion study as a part of scientific management "enforces over-pressure on the workers." But, surely, it is clear that the workers can work at high speed, or rather with high production and without extra fatigue, if unnecessary movements (which are often actually more numerous than the necessary movements in any particular operation) are eliminated. It is owing to the seeming impossibility of getting this fundamental fact understood that so little progress has been made.

Chapter IV., on the Hygiene of Working Conditions, is adequately treated by Dr. Greenwood, the sections on ventilation being likely to be especially helpful. It is to be regretted that the Fahrenheit scale and the English weights and measures must still be employed. The section on Lighting also is treated in a simple and adequate manner, taking account of the class of person likely to use the book. Cleanliness is perhaps one of the most important points to stress at the present time. "Factories must be kept in a cleanly state"; but how many occupiers are capable of understanding (*a*) exactly what this means and (*b*) the methods to be adopted to secure it? More attention paid to this particular matter would soon show a result in greater fitness and content and better output amongst the workers. It is very true that "disinfectants can never replace vigorous scrubbing, free ventilation, and sunlight."

In this section, as indeed is the case with others also, the impression is given of undue condensation, and in future editions it would probably be wise to encourage contributors to give rather more detail, even if this should involve omitting certain parts of their subjects.

Chapter V., on the Hygiene of the Individual, is written by Lucy Cripps, M.B. Here signs of undue preparation are obvious, but other criticisms must be offered. If the statement "the frequency of washing and shampooing the hair depends on the rapidity with which dandruff accumulates" were true, fewer dirty heads would be encountered. And are we really wiser for being told that "the hygiene of the auditory canal is special"? There is truth in the sentence, "Insufficient mastication (these hurried times) is often the main cause of indigestion," but is this the best way of stating it? And would it not be better to leave out dietetics altogether than to attempt to treat such a subject in 24 lines? Throughout the section there are signs of haste, and even of carelessness. We are surprised to learn that "scientific management is doing much to unite labour and capital." One reproach often brought against scientific management is that when introduced in the usual manner it leads to endless difficulties between capital and labour.

The remaining chapters on Food Values in Relation to Occupation, by Dr. Leonard Hill; on Food at the Works, by M. J. Hall, O.B.E.; the Ambulance Room, by Miss J. F. O'Brien; and the Industrial Employment of Women, by Dr. H. B. Adamson, appear to be excellently adapted to the needs of the persons into whose hands the book is likely to fall. Sympathy with, and experience of, the real needs of the factory worker are evidently the possession of those dealing with the sections on factory organisation; without these qualities any endeavour to teach others will always be futile.

We may congratulate Dr. Collis on his attempt to fill a difficult position, but at the same time we would warn him that to secure a real success he must be prepared to scrutinise more carefully the contributions to a second edition.

A MANUAL OF OBSTETRICS.

By JOHN COOKE HIRST, M.D., Associate in Obstetrics, School of Medicine, University of Pennsylvania, &c. With 216 illustrations. London and Philadelphia: W. B. Saunders Co. 1919. Pp. 516. 14*s*.

THIS work is intended as a companion to the author's "Manual of Gynæcology," and includes the methods of teaching he has employed for the last 20 years. It is interesting as illustrating the modern methods of dealing, in vogue in the States at the present time, with various of the complications of midwifery, and those methods differ from the ones prevalent with us in many particulars, it would seem.

Little embryology is given, but we notice a very old-fashioned account of the development of the amnion. We cannot agree that the attendant on a primipara should wait to rupture the membranes until they appear at the vulva, and it is, of course, only one membrane in such cases that requires rupture. In unreduced occipito-posterior presentations the author favours rotation with forceps, or even using the forceps as a lever to pry the head round; this is quite contrary to English teaching. In the treatment of an incarcerated retroverted uterus we are told that abdominal section or the induction of abortion is indicated; the author does not seem to know that if left alone the uterus will right itself in the vast majority of the cases. The section on the measurement of the pelvis is good, and the ingenious method of determining the index of the outlet devised by Dr. Daniels is quoted. It is interesting to note the recommendation of plugging for placenta prævia, and the statement that the vaginal pack is useless in controlling accidental hæmorrhage. The results obtained at the Rotunda by this method should be consulted by the author before condemning it so forcibly. The statement that a Champetier de Ribes bag has a limit of dilatation greater than the normal complete dilatation is not correct of the bag of proper size as designed by Champetier de Ribes, but unfortunately many faulty patterns are on the market. We cannot agree with the condemnation of the axis traction forceps and the suggestion that two pairs of forceps should be carried, a straight pair for use at the outlet and a Simpson's pair for general use, surely an unnecessary addition to the midwifery bag. The description of the Mauriceau method of delivering the child in a breech presentation does not correspond to that generally given in English text-books, and the omission to state that the traction should be made upon the shoulders seems to us greatly to impair its utility.

The book is well written and contains a great deal of interesting information, but, as we have pointed out, much of it is not in accord with the teaching current in this country.

THE TREATMENT OF SYPHILIS.

By Dr. H. S. BAKETEL. London and New York: Macmillan and Co. 1920. Pp. 167. 13*s*.

IN this work the author pays special attention to the technique of salvarsan injections. The standard he insists on is a very high one, and one which is only too frequently missed. Against this tendency to adopt slipshod and careless methods, especially in the use of the soluble salvarsan preparations, the author utters a very emphatic word of protest. In the earlier chapters the history and chemistry of salvarsan are summarised. Sufficient information is given to permit of the reader forming some idea of the process employed in its manufacture and of the steps which led to the ultimate discovery of arsphenamine. The use of intramuscular and subcutaneous injections of neoarsphenamine is fully dealt with, and the same conclusions apparently arrived at as those held on this side of the Atlantic. Although the excellence of the therapeutic results obtained from such medication is fully recognised, no sure means have yet been devised for the elimination of the attendant pain.

Dr. Baketel is an advocate of the use of very large doses of potassium iodide and of equally heroic injections of bichloride of mercury. In the case of the latter drug he recommends injections of ¼ to 1 gr. doses every other day. Although the possibility of nephritis is admitted, the author has never experienced ill-effects amongst his own patients. In the last few chapters the subjects of neuro-syphilis and of congenital syphilis come under discussion. The final chapter deals with the standard of cure. Altogether the subject of the treatment of syphilis is handled in a remarkably complete manner. The book is well arranged, the illustrations do much to assist the reader in understanding the technique advocated, and the work should furnish a guide to those who have a limited knowledge of the technique and of the "why, when, and how" of intravenous medication.

THE SOCIAL DISEASES.

By Dr. J. HÉRICOURT. Translated, and with a final Chapter by BERNARD MIALL. London: George Routledge and Sons, Ltd. New York: E. P. Dutton and Co. 1920. Pp. x. + 246. 7*s*. 6*d*.

IN the preface to this book Dr. Héricourt states that just as the animals are prone to various diseases, so human societies may suffer from sickness, and as there is a social physiology there is also a social pathology. This social pathology, according to the author, consists of four diseases—tuberculosis, syphilis, alcoholism, and sterility. His book was evidently written originally for the French public, and its outlook is necessarily French. Starting from the standpoint that "societies, like men, are the architects of their own misfortunes," Dr. Héricourt proceeds to point to the remedies. These are based in several instances on statistical data of a startling character, but we find the pathological dicta by which they are supported hardly such as would satisfy a British pathologist. As it stands, the book is a severe indictment of modern civilisation, and the final chapter by the translator, on Social Maladies in England, is a no less lurid account of our national shortcomings. While sympathising with the obviously good intention of the indictment the thoughtful reader gains an impression that the whole story is out of proportion, and that there in another side—a saner, soberer, healthier side—of human nature, which is not included in this estimate of the world's social diseases.

A MANUAL FOR MIDWIVES.

By C. NEPEAN LONGRIDGE, M.D., F.R.C.S., M.R.C.P., and J. B. BANISTER, M.A., M.D., B.C., M.R.C.P., F.R.C.S. Third edition. With 51 illustrations. London: J. and A. Churchill. 1920. Pp. 346. 7*s*. 6*d*.

THE authors have amplified and revised the third edition of this well-known work. The book is a good one of its kind, well balanced, and striking the happy mean so necessary in a work intended for midwives only. Its utility is much increased by the appendices, which include the rules of the Central Midwives Board, and the very useful series of leaflets from the pen of the chairman, Sir Francis Champneys, which deal with ophthalmia neonatorum, gonorrhœa, syphilis, cancer of the uterus, and cancer of the breast. This is a most valuable series, issued at the request of the Board, and for distribution among the laity as well as midwives. There is also an appendix by Mr. Sydney Stephenson, dealing with the care of the eyes during and after birth. We can strongly recommend this book to pupil midwives and their teachers.

BAILLIÈRE'S NURSES' COMPLETE MEDICAL DICTIONARY.

Edited by CONSTANCE M. DOUTHWAITE, Member of the League of Nurses of St. Bartholomew's Hospital, London. Second edition. London: Baillière, Tindall, and Cox. 1920. Pp. 206. 3*s*.

THIS is a good dictionary for its purpose. The definitions are crisp and served in agreeable literary form. Names are spelled with remarkable accuracy, except for a certain hesitation, all too common elsewhere, over the possessive case of the famous Robert James Graves. The dictionary can be cordially recommended to nurses and others who require a small book of ready reference on medical and allied scientific terms. The price is moderate and the production of the book is all that can be desired.

BERICHTE ÜBER DIE GESAMTE PHYSIOLOGIE.

Herausgegeben von Professor C. OPPENHEIMER und Professor P. RONA. Berlin: Verlag von Julius Springer. 1920.

THIS useful periodical was suspended during the war and is now again appearing fortnightly, as a continuation of the *Zentralblatt für Biochemie und Biophysik* of Hermann's and also of Maly's *Jahresberichte*, while it is associated with the German Physiological Society. Each section runs to 80 pages, the abstracting is done with care and judgment, while the subjects in review cover a wide area, not only as to the progress in animal, physiological, and pathological chemistry, but also as to chemistry in its application to agriculture, and the ever-increasing sphere of what is known in Germany as "Biophysik." There is no publication exactly comparable to it, either in its scope or its usefulness, in English or, so far as we know, in any other language. It gives reports from some journals which are not likely to be available, at least in these days, to many physiologists.

JOURNALS.

Journal of the Royal Naval Medical Service. July, 1920.—The first place in the July issue is given to a delightful account of a fine piece of successful work by Surgeon Commander L. F. Cope, R.N. Commander Cope reached Belgrade in December, 1918, when he found himself, as he says, "at a loose end," and was told by the senior naval officer to look round and find some occupation that would help the Serbs. This he proceeded to do, and his narrative should be read as a war story, for he gives a most effective picture of the disorganisation of a town that has changed hands in war, a disorganisation quite unknown to us at home, as none of our towns have been fought through. He shows well the difficulty of re-establishing the services of civilised life among the inhabitants of such a city, worn out as they are by the fatigue of war. "The condition of Belgrade was deplorable. ..... The hospitals had been very completely pillaged by the enemy; ..... while the empty wards had been deliberately and liberally befouled with fæces." He first tried to remove filth from the streets, but could get no carts; then he tried to build destructors, but could get no labour. In searching for labour he found a prison with 200 starving, verminous, and miserable Austrian prisoners. While trying to get this place cleaned he met Major Edward Stuart, a sanitary officer of the American Army, also busy at this work. They combined forces and "proceeded to make things move." They hunted for baths, found 12 and took four, found six disinfectors and seized two, and made a great discovery of cresol and sulphur. Then they were started, and in eight days "killed our first louse in spite of every difficulty officialdom could put in our way." The next day cases of typhus were reported, so something more must be done. As Belgrade had been a great Austrian military centre it was obvious that there must somewhere have been a great disinfecting station. But no one had any knowledge of it. So Cope and Stuart had to quarter the town to find it, and they did ultimately "locate it in a waste of snow-covered fields outside the town." They told the War Minister about it and ordered soldiers in for disinfecting. It was here their real troubles began. They stole six soldiers as a permanent working party; they got a Serbian officer as their adjutant. They chose him as he spoke French and German but no English, so they could discuss matters briefly between themselves without hurting his patriotism by their comments, for there seemed to be little business-like efficiency in the Balkans. They got soap from the Serbian Relief Fund, underclothing from the American Red Cross, electric light and water from the mayor, and coal from the Navy, which also lent an engine-room artificer, who made the disinfectors go (they had been made useless by the Austrians before they left). But the work would never have been done without Miss Simmonds, of the Sandes-Haverfield Canteen, "a Canadian, and the most remarkable woman I have ever seen." "Alone, without authority ..... she took a building ..... begged, borrowed, and stole" its equipment, and made it into a rest-house for Serb soldiers, who loved her and did anything for her. Miss Cullis, a lady sanitary inspector, was also "priceless." She knew no foreign language, and was a stranger in a new country, but "she performed miracles." She got a filthy house for 50 people cleaned inside and out, beds and bedding installed and disinfected when required, stopped thieving, and got the plumbers to do their work thoroughly. Two other disinfecting stations were established, one 40, the other 30 miles from Belgrade. There had been 67 cases of typhus in Belgrade to begin with. In the first week of the delousing campaign 20 cases occurred, but thereafter only 17 altogether, which shows how effective was this work. 15,000 men were deloused. Women and children were put under the care of American Red Cross nurses. Surgeon-Commander Cope tells his story well and gives us good photographs. Our only regret is that he gives us no picture of the Serbian soldiers, "the finest set of men I have ever seen."

British Journal of Children's Diseases. Vol. XVII., April-June. Edited by J. D. ROLLESTON, M.D.—In the first part of a paper entitled "Stigmata of Predisposition to Bone and Joint Tubercle," Mr. W. C. Rivers gives a historical retrospect of the literature dealing with the definite personal characteristics found more frequently in the subjects of bone and joint tubercle than in the non-tuberculous.—In his paper on Traumatic Stricture of the Urethra in Children and Young Subjects, with Some Remarks Concerning the Immediate Treatment of Ruptured Urethra, Mr. A. Ralph Thompson describes three typical cases of traumatic stricture in boys, the prognosis of which he regards as very grave. He strongly recommends suprapubic cystotomy as a routine measure, which greatly assists the adequate treatment of ruptured urethra. He points out that treatment by catheterisation may be carried out, but if it fails excision of the stricture will be required. In an operation for excision of a stricture he emphasises the importance of: (1) preservation of an intact urethra; (2) removal of as much fibrous tissue as possible; (3) deep burial in surrounding strictures of the sutured urethra.—Dr. J. Black-Milne describes two cases of anomalies of growth: Unilateral Macrosomia and Congenital Overgrowth of the Right Leg. In the first case, which occurred in a male aged 18, the right side of the body was affected and there were no anomalies of growth in the family or collateral lines. In the second case, which occurred in a patient of the same age and sex, the right lower limb was 1¾ in. longer than the left, but did not show such good muscular development. The chief point of interest in the cases was that the father showed a similar anomaly and of about the same degree. According to Dr. Black-Milne no heredity has been traced in any other cases of hemihypertrophy on record.—In a paper on Unilateral Dwarfism concerned with Congenital Multiple Chondromata Dr. Parkes Weber records a case in a boy, aged 13, whose right tibia, ulna, and radius were unusually short and showed the presence of chondromata on X ray examination.—In a Retrospect of Otology, 1919, Mr. Macleod Yearsley summarises the recent otological literature of pædiatric interest.—The abstracts from current literature are devoted to child welfare and otology, rhinology, and laryngology.

FRENCH SUPPLEMENT TO THE LANCET

Under the Editorial Direction of

Professor CHARLES ACHARD, PROFESSOR OF PATHOLOGY AND THERAPEUTICS IN THE UNIVERSITY OF PARIS. AND Dr. CHARLES FLANDIN, D.S.O., CHEF DE CLINIQUE A LA FACULTÉ DE PARIS.

SERUM TREATMENT OF HÆMOPHILIA.

BY P. EMILE WEIL,

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THE physiological basis of hæmophilia is a more or less considerable retardation of the blood coagulability; otherwise the blood is clinically and histologically normal. This retardation diminishes or disappears when the blood is placed in vitro in contact with human or animal blood serum. The subcutaneous or intravenous injection of human or animal serum corrects the fault in coagulation and momentarily heals the hæmophilia, being both preventive and curative. The serum provides the blood with the missing ferment, thrombokinase or thrombozyme. On these experimental results the present writer has established the therapeutics of hæmophilia.

Treatment of Actual Bleeding: (a) External Hæmorrhage.

Once the hæmophiliac diathesis is recognised, treatment varies according as the bleeding point can be reached or not.

Every external hæmorrhage will be treated locally. A piece of gauze soaked in blood serum (simple horse serum, antidiphtheria serum, hémostyl, &c.) is placed in contact with the wound. In some cases it is well to use serum desiccated in vacuo at 0°; immediate and definitive hæmostasis results.

Contact between the serum and the wound is indispensable. If clots are interposed the coagulating action is not produced. Every hæmophiliac wound must be cleansed under all circumstances without hesitation. In dental hæmorrhage dressing of the socket must be preceded by cleansing with abundance of normal saline to remove clots; a plug soaked in serum is then applied. If a hæmatoma has formed, as, e.g., the result of a penetrating wound, it is best to open the hæmatoma, remove the clots, and then apply the serum dressing. General treatment is usually not enough, whilst local treatment procures cessation of the hæmorrhage in a few minutes.

Serum treatment transforms the therapeutics of hæmophilia. It is no longer a noli-me-tangere.

(b) Internal Hæmorrhages.

In cases of internal hæmorrhage (deep-seated closed hæmatomata, hæmarthroses, hæmaturias, &c.) serum should be injected. If the serum is human, venous injection may be adopted, with almost immediate arrest of the hæmorrhage. If the serum is of animal origin (simple horse serum, hémostyl, antitoxic serum) the subcutaneous method must be used. We do not advise injecting deeply into the muscles; the injections are often followed by small effusions of blood, which would be painful under the pressure of aponeuroses.

As a rule, the quantity injected is from 20 to 30 c.cm. A single dose is enough to arrest the hæmorrhage, stronger or repeated doses being rarely necessary. No drawbacks attend the use of the same quantity for children. Ingestion of serum gives no results in internal hæmorrhage, except bleeding of the stomach, where the serum acts locally.

If the hæmorrhage returns, treatment in the same way must be recommenced. A draught of chloride of calcium (1 or 2 g. daily) may be prescribed, not only to increase the coagulating action of the serum but also to avoid serum disease. The addition of vaso-constrictor medicaments is not necessary for hæmostasis, but rectal injection, drop by drop, of glucose adrenalin serum seems very often to be useful, especially from the cardiovascular point of view when the loss of blood has been great.

Results of Such Treatment.

Properly directed serum treatment has always given us successful results. We do not advise recourse to gelatin, which could not be administered subcutaneously, but only by the rectum; injections of hemialbumose have seemed of small value.

We do not report here the very numerous cases in which serum treatment has brought about the arrest of bleeding following upon a dental extraction, circumcision, or in cases of hæmarthrosis or hæmatoma; we prefer to state the results of various authors who have used our method. Marcel Labbé has done well with serum injections in several cases of hæmophiliac hæmorrhages. Wirth (of Vienna) has by this means stopped hæmorrhages not yielding to any medication. Mauthner (of Vienna) has seen a dental hæmorrhage lasting three days stopped by an injection of 40 c.cm. of serum. Broca, Schiffers, Déjardin (of Liège), Lommel (of Ina) have published similar successes. Le Jemtel (of Alençon) arrested a very profuse external hæmorrhage consequent on an unimportant surgical intervention by an injection of antidiphtheria serum. In their theses on the treatment of stubborn hæmorrhages Eliçagaray and after him Giroud (of Lyons) report several cases in which the method was successful.

In a certain number of cases published the serum treatment failed (Dahlgren, Baum of Kiel). We ourselves have recourse to local, concurrently with general, treatment in open hæmorrhages, and in over a hundred cases we have not failed to master the loss of blood.

Incidental Preventive Treatment of Bleeding in Hæmophiliacs.

Preventive treatment may be incidental or continuous. In the former case the treatment is to enable the patient to undergo a surgical operation. It is enough to inject 20 to 30 c.cm. of animal serum subcutaneously, at most one or more days before the operation.

Since the rectification of the blood is very usually partial, we advise against subjecting hæmophiliac subjects to any but indispensable operations—extraction of teeth, opening of abscesses, operations for acute appendicitis, &c.—always bearing in mind the possibility of hæmorrhage. However, in practice we have never had accidents with patients in whom injections had been made before operation.

During the operation the wounds should be plugged with animal serum, and after operation a serum dressing should be applied.

Continuous Preventive Treatment.

In the second and more usual case one has to deal with children with a family history of hæmophilia and repeated hæmorrhage. If the parents understand their duty, continued treatment may be suggested. As the rectification brought about by injections only lasts from six weeks to two months, serum injections must be carried out every two months. Adult hæmophiliac patients, who are subject to recurrent accidents—hæmaturia, for example—are quite willing to undergo renewed injections in spite of the possible small anaphylactic drawbacks. In themselves very small and variable, these incidents (fever, urticaria, arthralgia) are not of such importance as to give up a treatment which really transforms the complaint.

We have followed thus half a dozen typical cases of hereditary hæmophilia, in which hæmorrhages were occurring every month or two months; after treatment they ceased for several years to show any symptoms of hæmophilia. At the outset their blood required several hours for coagulation, but at the end only 45, 30, or 14 minutes. The complaint had aged in several months as much as it would have done in 20 or 30 years without assistance.

The prognosis is transformed by the continuous serum treatment. Whilst Carrière, summing up a mass of hæmophiliac cases, estimates that 89 per cent. of patients do not live beyond 20 years, I have not lost one out of more that 50 patients. Moreover, under prolonged treatment the complaint becomes so attenuated that it seems as if treatment might even be given up after several years; this was well shown in one of our patients who, after six years of continuous treatment, went through five years of war without misadventure.

The important question presents itself whether, in women of a hæmophiliac stock, preventive serum treatment during pregnancy would enable them to bear healthy children. We have not yet had any opportunity to make any experiments in this direction.

Technique of Preventive Treatment.

The technique consists in making subcutaneous injections of blood serum in doses of 20 c.cm. every two months. Later on, after considerable improvement, injections are only necessary every three months. It is hardly possible to put off the injections any further.

In this continuous cure we have generally used animal serums without reason to regret it; but, if it could be done easily, human serums would be preferable. Chalier (of Lyons) has successfully used maternal serum, injected in doses of 30 to 40 c.cm. every fortnight.

Very good results have been obtained in hæmophiliac accidents by transfusion of blood. This method, though legitimate in serious hæmorrhage, cannot be recommended as habitual treatment, since blood tranfusions cannot be renewed every two months for years on end. In any case, we would utter a warning against subcutaneous hæmotherapy. In a serious case we have seen, after a dose of 25 c.cm. of human blood, an enormous hæmatoma form in the back and abdominal wall, the clot acting as a foreign body and causing a copious hæmorrhage.

COAGULATION OF THE BLOOD:

A STUDY OF THE ANTI-COAGULANT ACTION OF SODIUM CITRATE AND OF THE PART PLAYED BY CALCIUM IN THE BLOOD.

BY MARCEL BLOCH,

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THE study of the coagulation of the blood, which ought to be of great use in nosography, has been hampered by the insufficiency of the methods to measure its pathological variations. It is a phenomenon which lends itself with the utmost difficulty to exact measurements. In another place[1] I described numerous methods based on the speed of coagulation in vitro (methods of Vierordt, De Mutach, Biffi, Schultz, Angelo Petrone, Brodie and Russell, Wright, and Sabrazès). MM. Achard and Binet have just described a neat technique. The methods of Hayem and P. E. Weil are the simplest, and these workers have made a profound study of blood coagulation in numerous pathological states.

Retardation of coagulation in vitro can be observed in normal subjects and in affections such as pneumonia, acute articular rheumatism, associated with an excess of fibrin in the blood; but though direct examination may be able to prove states of diminished coagulability, it is only with difficulty that it allows of appreciating states of exaggerated coagulability. Finally, it is very hard to avoid causes of error.

[1] Marcel Bloch: La Coagulabilité Sanguine, Thèse, Paris, 1914.

Consequently the speed of coagulation in vitro does not always accurately represent the coagulability. To find some method of measuring "the forces producing coagulation" as they exist in the blood in the vessels it is necessary to prevent them from determining coagulation in vitro, to immobilise them whilst leaving them intact, and to restore their activity so as to measure them in the laboratory.[2] The use of *citrate of sodium* has enabled me to fulfil these conditions.

Action of Chemical Anti-coagulants in Vitro.

Very many substances are capable of hindering blood coagulation in vitro (acids, alkalis, salts, extracts of organisms, venoms, alcohol, &c.). But those alone of importance in establishing a method of measuring are such as are strictly measurable, and do not a priori seriously affect the important elements of the blood, as do acids, alcohol, &c. The most carefully studied and frequently used anti-coagulating salts are the oxalates of sodium and potassium, fluoride, and citrate of sodium.

The action of the *oxalates* is well known from the work of Arthus and Pagès.[3] A proportion of about 1 per 1000 in the blood causes incoagulability by the precipitation of calcium in the form of an insoluble compound. The introduction of a new soluble calcium compound (even solubilised calcium *oxalate*) into the oxalate mixture restores the coagulating property. Theoretically, it is of interest to add that Hammarsten and Pekelharing have shown that the process of coagulation in the oxalated blood is arrested at the stage of the formation of the fibrin-ferment or thrombin. The calcium salts would therefore be necessary to the transformation of the prothrombin into thrombin. But as soon as the thrombin is formed the calcium salts are no longer necessary, and coagulation proceeds even in their absence.

Sodium fluoride added to the blood also produces incoagulability by precipitation of calcium, but the addition of soluble calcium salts does not make the mixture coagulable. Bordet and Gengou[4] have shown that the precipitate of calcium fluoride thus formed had absorbed all or part of the coagulating ferments and even of the fibrinogen.

Now, if the amount of oxalate of sodium, used in the experiments described above, is slightly increased, results are obtained analogous to those got when fluoride is used. The insoluble oxalate of calcium has therefore operated like calcium fluoride to absorb some or all the substances (in the classic theory called the ferments) which give the blood its coagulating qualities. Even in smaller quantities the sodium oxalate possesses qualities noxious to the "coagulating forces" of the blood, though to a lesser degree. Citrate of soda is not open to these objections.

The Action of Citrate of Sodium.

Like oxalate and fluoride, citrate of sodium makes the blood incoagulable when added at the rate of about 1 per 1000. The addition of a soluble calcium salt—for instance, calcium chloride—immediately restores the coagulating property. The citrate has produced incoagulability by acting on the calcium in the blood. But the difference in action of the citrate and of the oxalates and fluorides is shown directly by an easily repeated experiment. The addition of chloride of calcium to a solution of the latter causes a dense white precipitate. The addition of chloride of calcium to a solution of citrate of soda occasions no precipitate. Contrary, therefore, to the oxalate and fluoride, if the citrate acts on the calcium it does not do so by way of precipitation.

More than ten years ago this action of citrate of sodium on the calcium perplexed biologists (Sabattani,[5]

[2] Two other indirect methods with the same aim have been described: (*a*) Wright, Chantemesse, and Cathala take a series of drops of blood from the thumb and examine the quantity of the admixture of oxalate of potassium necessary to prevent coagulation; (*b*) Et. Brissaud (Paris, Baillière, 1911) makes use of the properties of salted plasma, studied by Bordet and Gengou.

[3] Arch. de Physiologie, 1890–1891.

[4] Ann. de l'Inst. Pasteur, 1912.

[5] Journal de Physiol. Interne, xxx., 2.

1900–1901). In modern chemical terminology the calcium is in a latent state. In 1902 Arthus comes back to the question.[6] By its immobilising action on the calcium salts of the blood the citrate prevents the transformation of the profibrin ferment into ferment. Similarly citrated milk does not coagulate under the influence of the lab-ferment. Arthus has endeavoured to determine the nature of the phenomenon by means of ingenious experiments.

Citrate of soda is shown to be antagonistic to precipitating salts, and it may be considered as endowed with direct antiprecipitative properties. Now, the alkali oxalates and fluorides possess, on the contrary, no antiprecipitative action with regard to chloride of sodium. We have here a fundamental difference between the salts and the citrates.

We must add that Arthus's stable emulsions resemble colloidal solutions; that the alkaline earth salts and the calcium salts in particular have a very special precipitative action on them; and that these same calcium salts have a fundamental part to play in the blood and its coagulation.

The Action of the Citrate on the Blood Calcium.

In 1902, at the end of his essay, Arthus declared that it did not seem possible to set up any likely hypothesis about the anti-coagulating effect of the citrate in the blood. Contrary to Arthus, M. Luigi Sabattani[7] thinks that the anti-coagulant action of the citrate can be explained. This is due to his conception of the state of the calcium in the blood. In order that coagulation may take place, not only must a certain quantity of calcium salts be present, but also the ionised state of the calcium. The citrate which does not precipitate the calcium salts leaves the quantity of dissolved calcium intact, which was in the blood and which was enough for its coagulation, but it modifies its state of ionisation and thus annihilates it functionally.[8,9]

Part Played by Blood Calcium.

When the blood is citrated the pre-existent calcium dissolved is in no way diminished in weight; the citrated blood contains as many molecules of calcium salts in solution as normal coagulating blood, and yet it does not coagulate. It will at once recoagulate if another calcium salt is added. It must therefore be admitted that the citrate has occasioned a change of state of the blood calcium which completely arrests its action in coagulation.

This phenomenon is not isolated, and modern chemists can readily furnish examples of what they call "bodies in a hidden state." Examples might be multiplied, but it is enough for us to know that a body—metal or metalloid—can exist in a solution in such a state that it is incapable of manifesting its properties. This is what the addition of the citrate has done in the blood with respect to the calcium. The citrate has hidden the calcium.

If we may borrow terms from modern serology without in any way comparing the phenomena, we might say that the citrate inactivates the calcium in a calcic solution —e.g., blood—and that the addition of a little more calcium suffices to reactivate the solution.

Let us now sum up some of the discoveries of modern physical chemistry. The bodies which may be added to a given colloidal solution behave in two ways. Some, the "electrolytes," tend to precipitate the solution—e.g., certain salts of the alkalis or alkaline earths; they are *precipitants* or *instabilisers*. Others reinforce the capacity of the solution to remain in the colloidal state; they are *stabilisers*.

Let us, then, look upon the *blood plasma* as a *colloidal solution*. From the physico-chemical point of view this is the modern conception; it is that used by Nolf in order to establish his theory of coagulation. This blood plasma contains *electrolytic precipitants;* they are the calcium salts. If certain bodies like citrate of sodium are added to the blood they act as *stabilisers* of the colloidal blood solution and prevent the electrolytic calcium salts from exercising their peculiar precipitating properties, and this without in any way affecting the quantities of dissolved calcic salts. The *ion calcium* may therefore with the greatest ease be *active* and provoke coagulation, or *inactive* and bring about incoagulability.

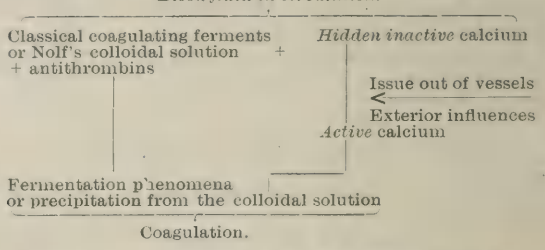
Suggested Hypothesis.

For this reason we feel at liberty to set up the following hypothesis: The blood when fluid and circulating in the vessels is in analysis chemically identical with the coagulated blood in a glass tube. The formation of fibrin is due to a change of physical state of those constituent elements which circulate as fluids in the vessels. Now, if, as we have seen is the case, a simple change of physical state of the calcium is enough to cause or prevent the coagulation of the colloidal sanguine solution in vitro, why not suppose that in the blood circulating in vivo the calcium exists in the inactive latent state? May not simply the issuing from the vessels, exposure to the air, contact with the walls of the recipient and with Nolf's thromboplastic substances (dust, powders) be enough to transform this hidden inactive state of the calcium into an active electrolytic precipitant state with respect to the colloidal solution?[10]

It is possible that the mechanism of the activation of the calcium is not simple. The anti-coagulating (antithrombin) substances of the plasma are perhaps "stabilisers" of the colloidal blood solution, antagonistic to the calcic precipitating electrolytes. These are antiprecipitant bodies, which would change their physical state on egress from the vessels under the influence of exterior contacts, lose their stabilising power, and set free the action of the calcium salts.

In any case we are led to assign to the calcium salts of the plasma the main active part in the phenomenon of the fluidity of the blood and the act of coagulation. This part is summed up diagrammatically in the following table:—

Blood fluid in circulation.



Physico-chemical Conception of Coagulation and of the Old "Diastasic Phenomena." Catalytic Coagulation Phenomenon.

There is in chemistry a whole category of phenomena, produced only in presence of bodies, which do not seem to partake in the reactions because they are not modified, but nevertheless they are necessary to their production. This is what is termed *catalysis*. We believe that coagulation belongs to the category of these catalytic phenomena, calcium being the necessary active body, the "catalyser."[11]

Nolf's idea, the theory of colloidal precipitations, is not as opposed as one might believe to the classical fermentation, enzyme, or diastase theories. Indeed, the modern theory of the diastases is very different

[6] Soc. de Biol., May 10th, 1902 (Inst. Pasteur de Lille).
[7] Soc. de Biologie, May 14th, 1902.
[8] Arch. ital. de Biol., t. xxxvi., f. 3.
[9] Pharmac. expér. Cagliari.

[10] It is well known that certain writers of to-day assign great importance to the sudden changes caused in the physical equilibrium of the serum with sudden disturbances created in the blood colloids "by commonplace, purely physical, causes, such as cold" (Widal). To phenomena of this order would belong the "blood crises" (with coagulation disturbances), anaphylaxis, injections of heterogenous albumins, paroxysmal hæmoglobinuria, asthma, urticaria, &c. See Widal, Abrami, E. Brisnaud, Joltrain, Société Médicale, Feb. 13th, 1914; Semaine Médicale, Dec. 14th, 1913; Presse Médicale, June, 1914.

[11] This term has already been applied to coagulation. The fibrin ferment performs the transformation of the fibrinogen into fibrin in the manner of a catalyser without itself taking part in the constitution of the fibrin (classical theory).

from that held a few years ago. There is a tendency to draw nearer to the original opinion of Arthus and Naegeli, who denied that the action of the diastases was due to their chemical constitution, but considered that they acted like special transmissible forces, such as electricity and light.

We are acquainted with a large number of enzymic phenomena where the presence of a trace of an acid, alkali, or salt is of fundamental importance, like the trace of calcium salt in coagulation. The importance of other mineral substances (iron, manganese) is as great in other diastasic phenomena (G. Bertrand, Trillat, Phocas). Finally, the discovery of non-albuminoid diastases and of purely metallic colloidal solutions, having the property of diastases (Bredig, Trillat, Robin, Bardet), has completely modified our conception of these latter. Their catalytic action appears to be due, not to the nature of the metal itself, but to the *colloidal form* in which it is presented. Thus, in all these former fermentation phenomena the part played by the mineral element steps into the foreground. Consequently, the part in coagulation which we propose to assign to the calcium is not exceptional. As regards the intimate nature of the mineral element in the catalytic phenomenon, it is of necessity still entirely hypothetical.

Application to Method of Measuring Coagulability.

In practice the blood is first mixed with a measured solution of citrate of sodium (1 c.cm. of blood in 4 c.cm. of citrate of sodium of 1 to 400). The dilution and calcic inactivation prevent the intervention of foreign contacts, the cause of so many errors in direct coagulation observations.

The next step is to divide equal quantities (2/10 c.cm.) of this citrated blood into a series of tubes containing increasing amounts of chloride of calcium (from 0·00005 g. to 0·0005 g. diluted in 4 c.cm. of isotonic salt solution).

At the end of several hours the series of tubes gives a succession of steps in coagulation, incomplete at first in the tubes containing little calcium, then more and more complete as we get near to the amount required for total coagulation. The tubes which mark commencement and end of coagulation are noted. The relationships between the quantities of citrate of sodium and chloride of calcium in these tubes constitute the "indices of coagulability." These indices are notably fixed for normal bloods (two at the beginning and one at the completion of coagulation); the stronger the coagulability the higher the indices, and inversely.

By this procedure we have been able to reveal various experimental and pathological variations of coagulability which other methods did not permit us to appreciate.[12] It allows of the most exact study of the qualities of the coagulum—normal retractility, hyper- or hypo-tractility, or irretractility.

Experimental Applications; Regulating Mechanism of Coagulability.

"In various organs (spleen, pancreas, lymphatic ganglions, small intestine, testes, brain, lungs) it is possible to reveal an anti-coagulating substance, probably identical with the antithrombin which passes from the liver into the blood under the influence of the peptone; in the organs this substance is masked by one or more substances which energetically activate the coagulation of the blood in vitro" (Doyon).

These substances, multiglandular in origin and inverse in action, balance each other and their result is coagulability; it is easy to show the instability of this state of equilibrium. If an animal is bled quickly and freely, the succeeding hours show a sudden fall of the indices followed by a reactional elevation above the normal. A return to the normal takes place only after a certain time. (Fig. 1.) If an animal is bled by degrees a fairly durable state of hypercoagulability can be produced.

The same phenomenon may be shown in man, after sudden or repeated hæmorrhages. We have here, perhaps, the explanation of the hypercoagulability found in certain affections (uterine fibroma) and accidents (thromboses, post-operation embolism).

[12] For details of procedure and results see Marcel Bloch, loc. cit.

Sudden loss of equilibrium may be observed on the sudden introduction into the animal of certain poisons, in particular of heterogeneous albumins. The experiment of the Schmitt-Müllheim type gives immediate prolonged

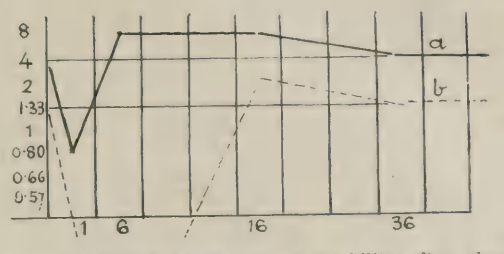


FIG. 1.—Fall followed by rise of coagulability after plentiful bleeding in the dog. Index of coagulability on the left of the chart, time in hours at the foot. (*a*) = commencing, (*b*) = complete, coagulation.

incoagulability of the blood of a dog which had just had an intravenous injection of propeptone with reactional hypercoagulability.

Clinical Applications: Sudden Disturbances of Coagulability.

We have here a new chapter of human pathology, which opened with the proof of disturbances of coagulability in the anaphylactic shock. They are comprehensible when we note the instantaneous formidable

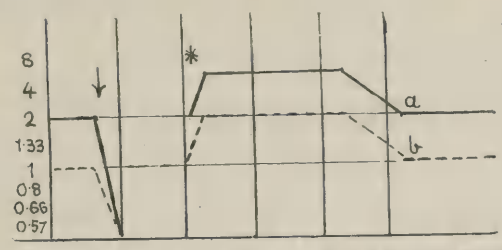


FIG. 2.—Incoagulability followed by reactional hypercoagulability after intravenous injection of peptone in the dog (shown by the arrow). The asterisk indicates a period 10 hours after the injection. (*a*) = commencing, (*b*) = complete, coagulation.

modifications undergone by the plasma elements in the experiment of peptone blood in the case of animals, and after copious hæmorrhages in men and animals. (Fig. 2.)

In the course of experimental anaphylactic shocks (Richet, Riedl, Kraus) it is possible to observe either the more or less complete incoagulability of the blood of the animal, or its hypercoagulability, which is often accompanied by fibrinolysis or redissolution of the clot. In human beings great anaphylactic shocks may be accompanied by phenomena of the hæmorrhagiferous class (purpura).[13] Certain symptom-complexes, such as paroxysmal hæmoglobinuria, urticaria, asthma[14] present coagulation disturbances in the course of the crisis (hypercoagulability, irretractility of the clot, fibrinolysis). In the fight against these hæmoclastic crises, or sudden entire losses of equilibrium of the plasma colloids, M. Widal has successfully used intravenous autoserotherapy.

Conversely it has been suggested to combat certain hæmorrhage conditions by means of the hypercoagulability consequent on anaphylactic shocks produced by reinjection of heterogenous serums (Dufour and Crow[15]).

Slow Disturbances of Coagulability.

These may be noted in numerous illnesses. With the index method we have determined the coagulability in a number of diseases.

[13] J. Halle and Marcel Bloch: Choc anaphylactique dans la sérothérapie antidiphtérique (Soc. de Pédiatrie, February, 1913).

[14] Widal, Abrami, et Brissaud: Semaine Médicale, Dec. 24th, 1913, Hémoglobinurie paroxystique, Id., id., et Joltrain, Soc. Méd., Feb. 13th, 1914, L'Urticaire, Presse méd., July 11th, 1914, L'Asthme.

[15] H. Dufour et Crow: Utilisation thérapeutique du choc anaphylactique, Soc. méd. des hôpitaux, June 5th, 1914.

With marked hepatic insufficiency *affections of the liver* produce a clear diminution of coagulability. The predominant part played by the liver amongst the organs regulating coagulability explains most of the hæmorrhagiferous accidents in liver cases.

Lesions of the kidney may also cause a lowering of the indices of coagulation, which partly explains the "hæmorrhagic diathesis" of certain cases of Bright's disease. In extensive œdema the hydræmia seems to have a direct action in reducing coagulability.

Cardiac affections modify the indices in various ways, probably in accordance with the state of the organ or organs most severely attacked in their functions.

The *lungs* play a most important part in the secretion of coagulating substances (Doyon, Morel and Kareff, Roger[16]). Considered clinically a mechanical congestion of the lungs may produce considerable diminution of coagulability (Marcel Bloch[17]). The same observation can be made in ordinary pulmonary tuberculosis during the period of softening.

In simple *pneumonia* hypercoagulability is constantly present, persisting for several days after defervescence. It must be noted, from the point of view of diagnosis, that in influenza, typhoid, and miliary tubercle the indices are normal or lowered. For prognosis lowering of indices of coagulation is a sign of deterioration. It is found above all in pneumonia of alcoholic patients with fatal termination.

In *polyglandular and endocrinous* affections coagulability may be disturbed. P. E. Weil[18] has recently insisted on the disturbances in coagulation in the course of menorrhagia of women presenting signs of ovarian, thyroid, pituitary, or suprarenal insufficiency.

In toxic infections coagulability is variable. Whilst always increased in *acute articular rheumatism*, it is usually lowered in *typhoid fever*, sometimes very greatly so in hæmorrhagic forms.

In certain toxic infectious cases, acute diphtheria, for instance, the indices are raised in spite of the hæmorrhagiferous conditions. Indeed, the key to the hæmorrhagiferous symptom complex is not always given by the study of coagulation; the conception of endothelio-vascular insufficiency or dystrophy must be conjoined with it. It may be proved by the "*signe du lacet*" (Weill, of Lyons). The hypertension induced by light constriction of a portion of the member provokes the bursting of small vessels in the subjacent zone and the immediate appearance of a fine scattered purpura.

The study of the vascular resistance and of coagulability combined permits of interesting distinctions in the purpura and thrombosis symptom complexes. By the side of purpura with diminished coagulability there are purpuras with normal coagulability but irretractility of the clot (insufficiency of blood-plates) and purpuras with normal coagulability and diminution of vascular resistance (endothelio-vascular insufficiency or dystrophy).

Similarly, it is possible to distinguish venous thromboses with increased coagulability (aseptic thromboses in childbirth, coagulability indices increased at the end of pregnancy), distinct from infectious thrombophlebitis, and, finally, thromboses with endothelio-vascular dystrophy, where the coagulability is normal but in which it is easy to prove a weakening of vascular resistance, sometimes hereditary in the family.

In the case of *hæmophilia* the problem is still more complex. In true hæmophilia we have considerable lengthening of the coagulation period, abnormal coagulability indices, sometimes precocious start, but enormous decrease of index of complete coagulation. *Hæmophilia states* must be placed beside them for comparison. These are states of very diminished coagulability and vascular resistance occurring in the severe types of purpura, hæmoglobinuria, pernicious anæmia, scurvy, &c., and in the hæmorrhagic forms of the acute exanthems.

[16] Roger, Les fonctions du poumon, Presse méd., November, 1912.
[17] Marcel Bloch: Loc. cit.
[18] P. E. Weil: La durée des régles, les ménorrhagies, troubles de la coagulation sanguine, Soc. de Biol., April 27th, 1912; Traitement par le sérum sanguin, J. de Méd. int., Oct. 10th, 1913.

Previous Contributions.

The French Supplement to THE LANCET—under the Editorial Direction of Professor Charles Achard, Professor of Pathology and Therapeutics in the University of Paris; and Dr. Charles Flandin, D.S.O., Médecin-Major de 2me Classe, Chef de Clinique à la Faculté de Paris—has appeared on the dates given in the following list, which sets out the titles and authors of the contributions:—

Sept. 21st, 1918: (1) The Microbic Diversity of the Enteric Fevers, by Professor Achard. (2) Post-Typhoid Atony of the Cæcum, by Maurice Loeper, Professor of the Faculty of Medicine and Physician to the Paris Hospitals.

Oct. 19th, 1918: (1) What the War has Taught Us about Tetanus, by Louis Bazy. (2) Tetanus Consecutive to Superficial Wounds and to Trench Foot: Treatment and Prevention, by Professor Raymond, Médecin Principal de 2me Classe.

Nov. 30th, 1918: (1) General Review of French Cardio-Pathology during the War, by Ch. Laubry, Physician to the Paris Hospitals, Médecin Major de 2me Classe. (2) Methods of Estimating Augmentation in Depth of Volume of Left Ventricle, by Dr. Bordet, Director of the Radiological Laboratory of the Centre of Cardiology of Professor Vaquez, Hôpital St. Antoine.

Jan. 11th, 1919: (1) Gunshot Concussion of the Spinal Cord, by Henri Claude, Professor in the Paris Faculty of Medicine, Physician to the Paris Hospitals; and Jean Lhermitte, formerly Chef de Clinique in the Paris Faculty of Medicine. (2) Contribution to the Study of the Manifestations of Emotional Shock on the Battlefield, by Cl. Vincent, Physician to the Paris Hospitals, formerly Medical Officer to the 46th and 98th R.I. and to the 44th B.C.P.

March 1st, 1919: The Surgical Complications following Exanthematic Typhus, by Dr. Paul Moure and Dr. Etienne Sorrel, Prosectors to the Faculty of Medicine, Paris, Médecins Aide-Majors de 1er Classe, Surgeons to the French Hospital at Jassy.

April 5th, 1919: (1) Nervous Complications of Exanthematic Typhus, by A. Devaux, formerly Interne of the Paris Hospitals, Médecin-Major de 2me Classe. (2) Note on the Epidemic Diseases Observed in Rumania during the Campaign of 1916–17, by Dr. Henri Vuillet, late Interne of the Paris Hospitals.

May 3rd, 1919: (1) Malaria During the War, by G. Paisseau, Médecin-Major de 2me Classe. (2) Distribution of Soldiers, Temporarily Unfit through Malaria, in Agricultural Colonies, by Professor E. Jeanselme. (3) Studies on Renal Function in Chronic Nephritis, thesis by Pasteur Vallery-Radot, reviewed by Professor Charles Achard.

June 21st, 1919: (1) Recent Work on Cerebro-spinal Fever, by C. Doptar, Professor, Val-de-Grâce, Médecin-Chef to an Infantry Division. (2) Meningococcal Rheumatism and Arthritis, by Dr. Paul Sainton, Physician to the Paris Hospitals.

Aug. 23rd, 1919: Radiological Examination of Pseud-arthroses before and after Operations of Bony Grafts, by Paul Aubourg, Professor Agrégé, Cuneo's Laboratory for Radiology. (Centre for Surgery of Bones, Hospital 75, Cannes.)

Sept. 27th, 1919: (1) Dysidrosis: its Parasitic Nature, by J. Darier, Physician at the Hospital of St. Louis; Member of the Academy of Medicine. (2) The Contagiousness of Favus in Man, by R. Sabouraud.

Nov. 8th, 1919: (1) Secondary Echinococcus, by F. Dévé, Professor at the School of Medicine, Rouen. (2) A Case of Peritoneal Echinococcus, by Charles Flandin, Chef de Clinique Médicale at the Faculty of Medicine in Paris.

Dec. 20th, 1919: French Work on Ictero-Hæmorrhagic Spirochætosis, by Marcel Garnier, Physician at the Lariboisière Hospital, Paris.

Jan. 31st, 1920: (1) Some Appliances for the Examination of the Nervous and Muscular Systems, by Dr. Jean Camus, Professeur Agrégé of the Medical Faculty in Paris; Médecin des Hôpitaux. (2) The Laws of Tremor, by Dr. Léon Binet, Interne des Hôpitaux, Paris.

THE LANCET can be ordered through any Library in France or through the following special agents:—

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THE LANCET.

LONDON: SATURDAY, AUGUST 7, 1920.

Unprincipled Medication.

THE Proprietary Medicines Bill, introduced by Lord ASTOR in the House of Lords on July 13th, raises in particularly acute form the right of the State, or of one department of the State, to restrict the liberties of a flourishing industry on the plea of benefiting the community at large. No adversary of the measure could state the case in stronger terms than those which can be employed in its advocacy. The Bill, now being discussed, sets out to prohibit the sale of such remedies as are sold under a trade name or manufactured by a secret process, unless and until they have been registered by the Ministry of Health, a formality which assumes a disclosure in confidence of their composition. The Bill prohibits altogether, under penalty of heavy fine or imprisonment or both, the sale of remedies purporting to cure certain diseases or disorders, of which a preliminary list of 12 is given in the Schedule to the Bill. The list contains at present the following items: (1) cancer, (2) consumption, (3) lupus, (4) deafness, (5) fits, (6) epilepsy, (7) amenorrhœa and other diseases peculiar to women, (8) diabetes, (9) paralysis, (10) locomotor ataxy, (11) Bright's disease, (12) rupture; and the Minister is to be empowered to extend, as he may think fit, by regulation laid before Parliament, a list already of a comprehensive nature. Other provisions in the Bill disallow the vendor of any proprietary remedy from entering into personal correspondence with those who buy and use his wares, and also the employment of the "trailer" advertisement—being the enclosure with one remedy of printed matter recommending another—becomes illegal. It is evident that if the Bill becomes law it will drastically restrict the operations of a trade forming a substantial section of the London Chamber of Commerce and known to contain more than 300 manufacturers or vendors.

Public opinion is, however, unanimous in support of any measure designed to prevent the sale of fraudulent medicines and of drugs or appliances intended for immoral purposes. All appear to be fully aware of the undesirability of "cure-all" claims. Yet considerable protest has been raised against the Proprietary Medicines Bill in certain journals, wherein it is variously described as an insincere measure designed for the glorification of the Ministry of Health, as a further invasion of public liberty under the pretext of coddling, and as a serious threat to the comfort and convenience of a large section of the public. It is even suggested that the victims of incurable cancer will be deprived by the Bill of the remedies required to soothe and alleviate their sufferings; that, in fine, it is not the public interest but rather the sectional interest of the medical profession which is at the bottom of the changes proposed. The history of the Bill easily disposes of it as a piece of sectional or self-interested legislation. The proposals are based upon and do not go beyond the recommendations of the Select Committee appointed in June, 1914, to inquire into the sale and advertisement of patent and proprietary medicines and appliances, and to report what amendment in the law was necessary. Doctors, as is natural, were members of that Committee, and doctors were heard in evidence; but in neither case had they any numerical predominance, and the report of the Committee, whose personnel was of a very varied character, was presented with unanimity. Medical men, indeed, did not themselves come out scatheless from an inquiry revealing almost incredible degrees of cupidity on the one side and gullibility on the other. The Committee spoke with regret of medical men who allowed themselves to be made "the catspaw and fool of the fraternity of the secret remedy," and they had evidence in two cases of medical men acting as directors of companies manufacturing secret remedies.

The plain truth is that the lurid evidence laid before the Select Committee, and quoted by Lord ASTOR in support of the measure, was more than sufficient to move any body of citizens, not blinded by prejudice and self-interest, to immediate and forcible action. The sale of proprietary remedies had been increasing by leaps and bounds for some years before the Committee was appointed. Remedies prohibited in America were being shipped in enormous quantities for use in this country. Touting swindlers made fortunes here, only to meet with fine and imprisonment on attempting to do the same in Paris. Australia had refused to sanction the importation of many of the remedies, and more of the literature, freely circulating in this country. Lastly, the attitude of the newspaper and periodical press in regard to secret remedies was, speaking generally, very lax. In 1914 advertisements of proprietary medicines constituted a considerable source of income for many journals; a number of small provincial papers could hardly have existed at all without them, and the medical press was not too carefully censored. This fact led newspapers, either from discretion or under compulsion—we are now quoting from the report itself—to exclude from their columns criticism or discussion of secret remedies. For all these abuses the Select Committee thought that prompt remedies should be found, and upon their recommendations the new Bill has been framed for the protection of the public—and with that sole object.

The Hospital Survey.

REFERENCE was made in a recent number of THE LANCET[1] to Sir NAPIER BURNETT'S lucid and informing survey of the financial position of the voluntary hospitals throughout Great Britain and Ireland for the five years 1914–19. From this survey the statistics of the hospitals of London are excluded, as they come directly under the purview of King Edward's Hospital Fund, while there is no information as to 200 hospitals which left the request for information unanswered, and from 32 others which intimated that they had incurred no deficit, and therefore required no special assistance. We should have liked details as to how these desirable conditions were arrived at, while it is possible that some of the 200 who remained silent were similarly fortunate. It is to

[1] THE LANCET, July 20th, p. 83.

be regretted, considering the value at the moment of telling such of the story as present circumstances warrant, that answers should not have been forthcoming from all the institutions approached.

The conclusion is come to from the survey that the hospitals of the country as a whole are solvent. This is founded upon Sir NAPIER BURNETT'S tables relating to the four countries of the kingdom, which show that in 1914–19, for the 670 hospitals taken into account, the total to be regarded as ordinary income was £15,771,346, amounting, with legacies not earmarked for any special purpose (£2,061,830), to £17,833,176; and that the total ordinary expenditure of the same institutions was £17,462,299, leaving an excess of income, plus legacies, over expenditure of £370,877. This, it must be borne in mind, refers to a special period, 1915–19, the conditions of which may never recur, but which will be followed by a period influenced by those conditions and bearing little or no relation to anything that preceded the war. No general excess of expenditure over income plus legacies took place before 1919, when the total ordinary expenditure rose substantially. Before the war there were no problems of hospital finance that required immediate solution if the work was to be kept going, although the increasing need for hospital development in accommodation and equipment was felt by all connected with such institutions, while the level of subscriptions was not rising with the rise in material ease. Now the problems of finance have become urgently pressing on account of the results produced by the war. It will be observed, with regard to the quoted figures, that the solvency of the hospitals as a whole is only to be accepted as proved if we admit that legacies, not earmarked by the testator for any specific purpose, fairly rank as part of the hospital's ordinary income. It is not unreasonable that they should be so treated whenever necessary. To set them aside as capital, so that the interest borne by them alone is spent on the everyday requirements of the institution, is an ideal procedure which all should aim at. At the present time it is a counsel of perfection, which in many cases could not be followed without reducing the usefulness of the hospital. To borrow involves paying a higher rate of interest than the legacies, if invested, would be expected to bear. The money once spent cannot, however, be used for those renovations, expansions, and developments which are not to be looked upon as objects of ordinary annual expenditure. It is exactly the need for extraordinary expenditure which is pressing with many hospitals. Some have incurred debts through struggling to keep efficient and progressive during and since the war. Others have only remained more or less free from debt through refraining not merely from expansion and development, but from necessary repairs, cleaning, and upkeep. To the conclusion, therefore, that the voluntary hospitals as a whole exhibit sufficient vitality to enable them to "carry on" a provision has to be added: they must be assured a fair start in a new era of peace—an era characterised by enormously higher prices, by nursing staffs at increased salaries working for shorter hours, and by ambitions to benefit the public stimulated rather than diminished by the difficulties to be overcome.

The re-establishing of hospital finances upon a satisfactory basis is being achieved in London by King Edward's Hospital Fund, with the recent distribution of £250,000 from the capital of its own Fund, and with the still more recent gift of a like sum, entrusted to the Fund by the Joint Finance Committee of the British Red Cross Society and the Order of St. John of Jerusalem. This opportune gift, announced by Lord FINLAY on July 23rd, has already been allotted to hospitals which are prepared to treat ex-Service men, and is to be devoted to improvements rather than maintenance. It does not help these hospitals to catch up with their outstanding arrears of necessary repair and replacement. The immediate need of the hospitals of the United Kingdom outside London remains to be met; it is admittedly not so urgent. There are hospitals which can show a small excess of ordinary income, or of income plus legacies over expenditure, but it is not possible, and would not be just, to take from these in order to pay the debts of those whose expenditure has exceeded what they have received. Also, as Sir NAPIER BURNETT points out, it would not be fair to penalise those hospitals which have kept within their income by only subsidising those which have exceeded it. He advises that from any fund, hereafter available for the purpose, grants should be made upon inspection of individual hospitals by a competent authority constituted for that purpose. Further than this, he considers that for London and the country a sum of not less than three-quarters of a million is needed to meet the cost of alterations and repairs to buildings, and other matters with regard to which there are now five years of arrears to be made up. This means the expenditure of a million for immediate purposes, quite apart from an urgent need in many places for increased hospital accommodation. The provision of this further accommodation, as well as the more pressing matter of placing the hospitals as they stand in a satisfactory financial position, constitute a national question, and as to this Sir NAPIER BURNETT writes at the conclusion of his survey, which is addressed to the Joint Council of the British Red Cross and Order of St. John: "On another occasion I hope you will allow me to put before you some suggestions as to how far the State should be called upon to render assistance, and what the basis of such assistance should be." It is satisfactory to observe that, after a close study of existing conditions, the State assistance postulated does not exceed something in the nature of a grant in aid, supplemented by necessary changes of organisation and administration. The necessity will still remain for continued and increased generous contribution by those who have the power to give. After all, the voluntary system can only be saved if the public have the mind to save it.

The Significance of Sudden Cures.

To lose a sense of the marvellous is one of the penalties of advancing years; it is a sad day when the grown-up ceases to wonder at the great things of Nature and Art, and equally tragic when the physician is unimpressed by life and death. It is, indeed, a wonderful thing to feel the pulse beat again in response to some heroic remedy, to see the pallor of apparent dissolution replaced by the faintest flush of returning life. Doubtless such dramatic incidents are less common in everyday professional work than the long struggle against

disease, unrelieved by any particularly rapid alteration in a favourable or adverse direction. To most of us, in fact, a sudden cure, apart from the occasional striking turns in the course of acute organic affections, or the results of operative or manipulative interference, is suggestive of a hysterical or functional state; while what is unexpected, and therefore miraculous to the lay mind, is a therapeutic commonplace to the neurologist.

As all the world knows, rapid cures of hysterical disabilities have occurred with monotonous frequency, and, variable though the methods may be whereby they are effected, few will be found to deny a common factor in the underlying mechanism, with a knowledge of whose action an ever-widening circle of neurologists and psychotherapists are familiarising themselves, to the increasing benefit of the sufferers from psychogenic disease. None of those who thus daily come in contact with the manifestations of hysteria is likely to claim any supernormal powers beyond those of his fellows; on the contrary, intimate acquaintance with the why and the wherefore has reduced the "marvels" of psychotherapy to the level of cause and effect. It is, therefore, with some curiosity that we turn the pages of "Twenty Cures at Lourdes,"[1] a recently published translation, by two members of the Order of St. Benedict, one of whom has a medical degree. We find ourselves in sympathy with the assertion, both of the author in his introduction and of Sir BERTRAM WINDLE in his contributed preface, that the cases therein cited with some detail are to be judged on their medical merits by medical men, who are to be the final arbiters whether, as Sir BERTRAM WINDLE believes, "such cases are wholly outside the experience of ordinary medicine" and whether they "fail to follow recognised laws." We may select the case of GABRIEL GARGAM, since Dr. DE GRANDMAISON says it "is certainly one of the most interesting and extraordinary to be met with in the annals of Lourdes."

GABRIEL GARGAM, a post-office employee, was in a railway collision on Dec. 17th, 1899, was hurled violently many feet away into snow, and was not picked up till some seven hours afterwards. It was then found that he was "covered with wounds," had fractured his collar-bone, and was paralysed in the lower limbs. He came under the care of Dr. DECRESSAC, of Angoulême, who reported a year later that he had rigid paralysis of the lower extremities, with pronounced wasting of the same, loss of all forms of sensibility up to the level of the pelvis, exaggerated deep reflexes with ankle clonus, exceptionally brisk abdominal reflexes, slight bladder difficulty in certain positions only, and distinct pain on pressure over the second lumbar vertebra. The arms were normal, but the trunk was rigidly paralysed in extension. Six months later the same practitioner noted increasing emaciation, pains more or less all over, and similar objective signs to those just mentioned. On these data Dr. DECRESSAC made a diagnosis of amyotrophic lateral sclerosis, and pronounced the condition incurable. His partner, Dr. TEISSIER, diagnosed diffuse meningo-myelitis from compression of the cord, and Dr. DE GRANDMAISON, favouring the latter diagnosis, says: "In all probability the second lumbar vertebra is where the initial traumatism occurred."

Now it is superfluous to point out that any acquaintance with the elementary facts of neurology would enable the physician at once to exclude amyotrophic lateral sclerosis, in view of the complete loss of all forms of sensibility in the legs as far as the pelvis; that would be the last disease to be suggested to him from consideration of the facts connected with the onset of the affection in GARGAM'S case. The alternative diagnosis of compression meningo-myelitis is excluded with equal facility. A traumatic lesion at the second lumbar vertebra corresponds to the lower part of the conus medullaris and the cauda equina roots, and would produce an atonic paralysis with absence of the deep reflexes and with gross sphincter impairment. It is a simple impossibility for a compression at that point to give rise to a rigid paraplegia of trunk and legs with exaggerated deep reflexes and ankle clonus. Leaving these patently erroneous diagnoses, what are we to think of a rigid paraplegia involving the trunk muscles in which the abdominal reflexes are extremely active? The tyro in neurology knows that observation alone casts the gravest doubts on any diagnosis of organic pyramidal disease at all. In none of the reports is mention made of the plantar reflexes, an omission which, with others that will at once occur to the neurologist, renders the clinical description almost valueless and shows that no reliance can be placed on Sir BERTRAM WINDLE'S statement that "all the cases are fully dealt with in a clinical manner."

On such data as are given, however, anyone familiar with nervous disease would make a diagnosis of an ordinary hysterical paraplegia, nor is there a single symptom or sign in the account that is incompatible with that diagnosis. We are not in the least surprised, accordingly, to be told that during the procession of the Blessed Sacrament at Lourdes some twenty months, apparently, after the accident, GARGAM, who was lying on a stretcher, rose to a sitting position and exclaimed, "I am cured!" making a rapid convalescence. We are astonished, however, that the case should be cited seriously in support of the contentions of the Lourdes authorities. Dr. DE GRANDMAISON invites the criticism of the medical profession, and we have taken him at his word. One of the most extraordinary cases turns out to be one of the simplest. So far from its being wholly outside the experience of ordinary medicine the exact reverse is the case, and we should hesitate to waste time over such banalities were it not that the book challenges the accepted interpretation of the influence of psychical over physical states. Sir BERTRAM WINDLE says "in cures like that of GARGAM it is abundantly clear that there was no kind of suggestion," a rash statement to make when no hint is given of any psychological examination of the patient. GARGAM made a good recovery and has continued, apparently, in excellent health. Identical recoveries are being made daily by patients who have the good fortune to come into the hands of those who know their work, thanks to the immense impetus given to the study of the subconscious mind by the experiences of the war. It is because of exactly such cases that the teaching of clinical psychology and psychotherapy should be encouraged in the medical schools; thence will issue a generation of practitioners better equipped than their predecessors to deal with the protean manifestations of the mind diseased. When neurological diagnosis reaches a higher standard, and functional cases are recognised and treated by the expert practitioner long ere the disease becomes firmly established, pilgrimages to grottos will cease.

[1] Twenty Cures at Lourdes. By Dr. de Grandmaison. Translated by Rev. H. Bévenot, O.S.B., B.A., and Rev. L. Izard, O.S.B., M.R.C.S., L.R.C.P. With Preface by Sir Bertram Windle, M.D., F.R.S. London: Sands and Co. 1920. 7s.

Annotations.

"Ne quid nimis."

THE WORK OF THE NATIONAL PHYSICAL LABORATORY.

THE recently issued report of the National Physical Laboratory for the year 1919 is replete with medical interest in so far as it relates to departments engaged in the standardisation of instruments essential in practice. Apart from medicine the authorities—and the general board includes the leaders of scientific research in all directions—have been able for the first time to disclose the details of certain war work of a confidential character which curtailed the normal activities of the laboratory in relation to research and the tasks of standardisation. It was not possible, for obvious reasons, to give details bearing on war material in the reports made by the heads of departments, or to refer to the special work in progress. The report now presents some account of the war work undertaken and, while necessarily still incomplete, the particulars furnished indicate the importance of the duties discharged by the laboratory in relation to the war. The cataclysm has proved a catalyst in so many directions, and not least in stimulating the activities of the National Physical Laboratory.

Coming to work of medical significance, reference may be made to the standardisation of clinical thermometers. The laboratory was originally asked to arrange for the testing of 20,000 clinical thermometers per week, but it was soon realised that the number to be dealt with would be about 30,000 per week, and provision had to be made for this amount. This demand on the resources of the laboratory arose out of the Clinical Thermometer Order of the Ministry of Munitions in October, 1918. It would appear from the report that the average number of clinical thermometers rejected at the present time is slightly over 3 per cent., while at the beginning of the Order the number was about 5 per cent. This official movement has undoubtedly had the effect of making the clinical thermometer a very accurate instrument at the service of the clinician. The publication in our columns of a series of articles may be recalled for they drew attention to the importance of official standardisation in this matter.[1] These articles form an impressive memoir of the evolution of the mercury column as an index of temperature from about 1866 to the present time. It is also interesting to note that Sir Clifford Allbutt was the pioneer of the present small type of accurate clinical thermometer.

A number of problems connected with the optical abilities and disabilities of glass was also investigated by the National Physical Laboratory, and the results were most satisfactory, the work in this direction having established the important fact that this material can be made as well at home as abroad. Upon this it should follow that the manufacture of special glass for lenses involved in the construction of, amongst other things, microscopes, spectroscopes, saccharimeters, polarimeters, and photographic accessories will remain a home industry. Not less ahead was the work on radium testing. The number of samples of radium of high content tested during the year was 88, containing altogether about 6175 mg. of radium bromide of the approximate value of £80,000. Details as to the efficiency of the preparations submitted are given in the report. X ray investigation took a minor position in the laboratory's work owing to pressure in other departments in connexion with the war, but preparation is now being made in regard to the measurement of the absorptive qualities of materials used for protective purposes in radiography. There have been unnecessary martyrs in this field, and among them members of our profession have suffered and died not knowing what potentialities for evil were hidden in these radiations. Lastly, the progress of medical research is clearly dependent upon the accuracy of the laboratory apparatus placed at the disposal of the investigators, especially in the field of biochemistry, and the control which the National Physical Laboratory suggests in regard to the calibration and hall-marking of such apparatus will receive the approval of all scientific men, while the proposed standardisation of scientific glassware may, it is hoped, come into force in the near future. This is a good record of work, and the National Physical Laboratory is an important national institution.

[1] Investigations on Clinical Thermometry: Continuous and Quasi-Continuous Temperature Records in Man and Animals in Health and Disease. By G. Sims Woodhead, M.A., M.D., LL.D., professor of pathology, Cambridge; and P. C. Varrier-Jones, M.A., M.R.C.S., L.R.C.P., Foundation Scholar, St. John's College, Cambridge (From the Pathological Department, University of Cambridge), THE LANCET, Jan. 22nd, Feb. 5th, 12th, 26th, and March 4th, 1916.

ANTHRAX AND NOTIFICATION.

ANTHRAX is one of the occupational diseases of which the occurrence must be notified to the Chief Inspector of Factories. Poisoning by phosphorus, mercury, arsenic, lead, and toxic jaundice are the others. The result of notification of these diseases has been remarkable. Industry has expanded rapidly, but the diseases have simultaneously contracted in the last 20 years. Phosphorus poisoning has disappeared; mercury and arsenic only linger to cause a few cases of illness each year; lead poisoning is restricted within an ever-narrowing circle; toxic jaundice, due to tetrachlorethane and trinitrotoluene, only raised its head during the war to be promptly throttled by a well-planned attack. Anthrax alone has maintained its toll of victims; but even here the number of cases in proportion to those exposed to risk is far smaller than of old; and it is no longer the scourge to the woollen industry which earned for it the name of woolsorters' disease. That industry has combined to fight it; and a scientific scheme for disinfecting all possibly infected wool as it is imported bids fair ere long to free the industry from its old enemy. Anthrax, however, affects other animal products besides wool, as was demonstrated by the outbreak which recently occurred in this country and in America from the use of shaving brushes made from infected foreign hair. Strict precautions are now enforced to ensure disinfection of all such materials. Foreign hides and skins are other sources from which infection may arise, and precautions have to be observed in handling them. But the anthrax bacillus seems almost uncanny in its capacity for eluding disinfection and precautions. It will sneak unsuspected on horsehair through a carpet factory and infect the hand of a carpet-layer; or gaining access to wall plaster, it will attack a paperhanger; or, as in the case referred to recently in the House of Commons, driven from factory premises, it will lurk in skins in a warehouse to which regulations do not apply. Nevertheless, notification betrays its twists and turns, and enables the cordon of precautions to be drawn ever tighter. Here we see the value of notification of disease at its best, for it is only of value when followed up, when research is embarked upon to discover means of prevention, and when those means are enforced. Notification only indicates the field for inquiry; it is no panacea in itself. Without investigation and compulsory precautions notification only alarms without giving confidence.

SPIROCHÆTAL HÆMOPTYSIS.

THERE is a growing tendency to attribute many of the symptoms occurring in the subjects of pulmonary consumption to the action of organisms other than the tubercle bacillus. In the May number of the *American Review of Tuberculosis* (Baltimore: National Association for the Study and Prevention of Tuberculosis) Dr. A. N. Sinclair gives prominence to the part played by Vincent's spirochæte in the provocation of hæmoptysis in cases of pulmonary tuberculosis. He found this micro-organism in a large proportion of cases, and it was present in 256 out of 410 cases of pulmonary tuberculosis. Of the 256 positive cases, 71 per cent. were complicated by hæmoptysis, whereas of the 154 negative cases only 36 per cent. were thus

complicated: He also found that out of 238 cases of hæmoptysis 182, or 76 per cent., harboured the spirochæte, whereas of the 172 cases without hæmoptysis only 74, or 43 per cent., harboured the spirochæte. Thus, the presence of Vincent's spirochæte in the sputum makes hæmoptysis a comparatively probable complication. The author also argues that in the treatment of hæmoptysis the presence of this micro-organism is an indication for special restriction of exercise and general freedom. His contentions will certainly stimulate others to examine tuberculous sputum for the presence of a mixed spirochætal infection.

TARTAR EMETIC IN SURRA.

THE Agricultural Research Institute at Pusa has issued a bulletin dealing with the treatment of surra in camels by intravenous injection of tartar emetic. The author of the pamphlet is Mr. H. E. Cross, M.R.C.V.S., described as camel specialist at Sohawa, Punjab. Surra is a very fatal disease among camels, due to infection with trypanosomes. Mr. Cross, who has conducted a number of valuable investigations into other diseases of camels, injected six camels suffering from surra with a 1 per cent. solution of tartar emetic, and four of them were cured. Great care was taken to ensure the solution entering the vein, since in camels, as in human subjects, sloughing is liable to ensue if any of the solution passes into the subcutaneous tissues. The fluid was injected slowly at blood temperature. Mr. Cross found that 600 c.cm. of the solution could be given in the day if divided into three injections spaced out at 2–3 hour intervals. In four of the six camels treated no trypanosomes appeared in the blood after the injections.

METROPOLITAN WATER BOARD RESEARCHES.

WE have received the thirteenth research report issued by the authority of the Metropolitan Water Board from the chemical and bacteriological laboratories under the control of Sir Alexander Houston, Director of Examinations to the Board. An outstanding feature of this report is the study that has been given to the question of rapid filtration. This suggestion of speeding up is described as a contentious but most important subject, and by rapid filtration, we are told, is meant any apparatus, installation, or process, which filters at a much faster rate than is found in connexion with slow sand filters in which "washing" is effected by mechanical means. Without entering into the details of the process, except to say that it involves usually the use of a coagulant—e.g., aluminium sulphate—we may briefly refer to Sir Alexander Houston's opinion on the subject, which is, to speak generally, that in cases when a water is epidemiologically satisfactory but highly coloured, as in the case of moorland supplies, rapid filtration with the use of a coagulant achieves the most satisfactory results. He makes, however, important reservations, and asks whether it is permissible to filter stored water so rapidly, for though it may lead to material economic gain and the saving of filtration area, it is well established that ante-filtration or post-filtration sterilisation processes produce a water which is epidemiologically safe, innocuous, tasteless, and reasonably satisfactory from a physical and sentimental standpoint. The suggestion seems to be that so far rapid filtraton has not the evidence of experience behind it in regard to safety for the water-consuming public, though it might be combined with a chlorination process without adding seriously to the expense of treatment. The proposed changes in treating our raw water-supplies need to be very carefully studied lest any innovation is introduced at the price of health. The results of chemical analysis are, at all events, shown to be less satisfactory obtained with rapid filtration than with slow sand percolation, and the bacteriological results are not encouraging. Security, however, seems to reside in a chlorination process added to old-time procedure, and Sir Alexander Houston states that it is debatable whether the policy of substituting in connexion with new works a less expensive rapid for a more costly slow sand-filtration process is sound. The point has evidently arisen out of the increased demand of labour and cost of working materials. The use of chlorine has led to the nuisance of evil taste, but this bids fair to be overcome, while an interesting outcome of the water laboratory researches has been that when filtration has proved unsatisfactory this has been shown to be due not to floods, but to a seasonal development of diatoms governed by bright weather and temperature. The report is most interesting, and contains an admirable series of reproductions of photographs of deposits from raw and filtered supplies, demonstrating the efficiency or discrepancies of the filtration processes.

HEREDITARY SPASTIC PARAPLEGIA.

Dr. V. R. Mason and Dr. W. F. Rienhoff, jun.,[1] of the Medical Clinic, Johns Hopkins Hospital, report four cases of the rare hereditary disease of the central nervous system known as hereditary spastic paraplegia which affected members of one family for three generations. The condition was first described by Strümpell, who reported two cases in 1880, and a few years later was able to demonstrate the pathological basis of the syndrome. Since then the records of about 60 affected families have been published. The malady usually affects individuals in only one generation, but in seven of the families recorded characteristic symptoms were present in more than two generations. Ætiological factors, other than heredity, are not known. The symptoms may become manifest at any age, although it is characteristic of hereditary diseases of the central nervous system that the age of onset is about the same in individuals of the same generation. There is no evidence that sex plays an important rôle either in the occurrence or the transmission of the disease. The fundamental symptoms from which the disease derives its name is a spastic paraparesis which may involve the upper extremities to some extent after the condition has progressed for many years. The most important subsidiary symptoms are tremor of the tongue, as a rule intentional in type, disturbances of speech, optic atrophy, nystagmus, ocular palsies, bulbar disturbances, scoliosis, pes equinovarus, ataxia, muscular atrophies, and occasionally some mental impairment. Sensation and the sphincter functions are usually unaffected. The condition closely resembles both Marie's and Friedreich's hereditary ataxia in its ætiology and pathological anatomy. All three diseases begin usually about puberty, progress slowly to a certain point, and then become stationary. Moreover, typical or pure cases of any of the three affections are rare. Symptoms common to all three diseases have been observed, such as nystagmus, tremor, and pes equinovarus. In each disease there is a marked combined sclerosis of the postero-lateral tracts of the cord of the type characteristic of hereditary disease of the nervous system. The differential diagnosis is in some cases impossible, but in the majority the presence or absence of paraplegia, or ataxia, is distinctive.

EMBOLIC ANEURYSM OF PERIPHERAL ARTERIES.

EMBOLIC aneurysm of peripheral arteries is rare. In the *Glasgow Medical Journal* Mr. Douglas K. Adams has reported two cases which, by a curious coincidence, occurred in the same wards within a month of one another. In the first case the patient was a metal-polisher, aged 29 years. He was admitted on Dec. 3rd, 1919, complaining of dyspnœa of four years' duration. For some years he had "rheumatic pains in the legs" and the ankles occasionally swelled. On admission he was found to be poorly nourished and pale. The fingers were clubbed. The apex beat was in the fifth interspace an inch outside the nipple line, and cardiac dullness extended half an inch to the right of the sternum and to the upper border of the third rib. A soft blowing mitral systolic murmur was heard, and a

[1] Bulletin of the Johns Hopkins Hospital, June, 1920.

rough aortic systolic. The second aortic sound was almost replaced by a soft diastolic murmur. The pulse was of the water-hammer type. Over the lungs the percussion note was slightly impaired, especially at the bases, and râles were heard at the left base. On Dec. 10th the lower border of the liver was found palpable, and he complained of generalised rheumatic pains, but the temperature had not risen. Aspirin and sodium salicylate seemed to give relief. On the 16th he complained of pains radiating from the buttock into the left thigh, and on the 23rd a swelling of the size of a hen's egg developed between the great trochanter and posterior superior iliac spine. It was fluctuant and pulsatile. A blood culture was negative. Embolic aneurysm of the gluteal artery, due to ulcerative endocarditis, was diagnosed. The posterior division of the left internal iliac artery was ligatured and the swelling disappeared. After the operation the patient was troubled with vomiting, abdominal distension, and pain, and also with pains in the chest and dyspnœa. The pulse became irregular and fast, and he died on Jan. 3rd, 1920, from cardiac failure. At the necropsy the pericardium was found thickened and opaque, with fibrinous exudate on its surface. The heart was much enlarged, there being great hypertrophy of the ventricles. Both mitral and aortic valves bore numerous vegetations, some apparently recent. The root of the aorta showed signs of sclerosis, with some calcareous deposit. The lungs were adherent to the chest wall and diaphragm. On the left gluteal artery there was an aneurysm of the size of a hen's egg, containing laminated clot. In the second case the patient, a chauffeur, aged 33 years, was admitted on Jan. 30th, 1920. He complained of loss of power in the left arm and leg of three months' duration, which began suddenly in November, 1919. He had been a soldier for 15 years and contracted malaria and dysentery in India in 1906. He had an attack of "rheumatism" in May, 1915, and of pleurisy in France in October, 1918. Otherwise his health had been uniformly good. On admission he was well nourished but anæmic. The apex beat was in the fifth interspace just outside the nipple line and was diffuse and heaving, with a presystolic thrill. Cardiac dullness extended to the upper border of the third rib, the right sternal margin and three-quarters of an inch outside the left nipple line. The percussion note was slightly impaired over the manubrium. There were a loud mitral systolic murmur and a rough diastolic. At the aortic cartilage was heard a rough systolic murmur and the second sound was replaced by a soft blowing murmur. The arteries were somewhat thickened. The pulse was 96 and regular, but "water-hammer." There were left spastic hemiplegia with extensor response and paresis of the face. After a few days enlargement of the liver was noted. There was effusion into the left knee-joint. The temperature rose to 100° F. On Feb. 12th he complained of severe pain in the right arm, and paralysis of ulnar distribution with wasting of thenar and hypothenar eminences was noted. In the middle of the forearm towards the ulnar side a pulsatile swelling was found. Mr. R. B. Carslaw operated under local anæsthesia and found a fusiform aneurysm of the right ulnar artery to the sheath of which the ulnar nerve was adherent. As the general condition was unsatisfactory the artery was ligatured proximally and distally. Death occurred a few days later from failing heart. It is noteworthy that in both cases there was a rheumatic history and the blood culture was negative. Irving Simons,[1] in a review of bacterial endocarditis, gives a list of the recorded cases of embolic aneurysms. These include sciatic artery (one), ulnar artery (one), femoral artery (two cases) and popliteal artery (one).

[1] Quarterly Journal of Medicine, April, 1914.

BRIGHTON AND JUVENILE WELFARE.—The Brighton and Hove Council for Juvenile Welfare has decided to appoint a whole-time paid organiser at £350 per annum. Both municipal education authorities have voted a grant of £150 towards the work. The problem of juvenile crime is as difficult to face in Brighton as elsewhere, and the efforts of the council merit attention and support.

NATIONAL HEALTH INSURANCE:

SOME DEFECTS IN MEDICAL ADMINISTRATION AND THEIR REMEDIES.

A MEMORANDUM on some of the medical aspects of the National Health Insurance Act, drawn up by Sir James Mackenzie and the staff of the St. Andrews Institute for Clinical Research, has been issued as an appendix to the report of the Inter-Departmental Committee appointed to consider and report upon the form of medical record to be prescribed under the terms of service of insurance practitioners contained in the Medical Benefit Regulations for 1920. On the general aspects of this report we commented in a leading article last week. The memorandum has been drawn up with a view to indicate the principal defects in medical knowledge which exist at the present time and which impair the success of the Act, and also to indicate some steps which can be taken to remedy them.

Defects in Medical Knowledge.

1. *Diagnosis, especially of the early stages of disease.*—There is an idea current that diagnosis in the majority of cases is so simple that little difficulty should be found in recognising from the patient's symptoms the nature of the disease from which he suffers, and scheduling it under a definite classification. This is required for a variety of purposes, such as army statistics, club certificates, the Insurance Act, death certificates. Such diagnoses are, for the most, imperfect, and statistics based upon them are misleading, because the classification of disease is at present based largely upon morbid changes which have been discovered and studied after death.

The reason for this is that at one stage of medical history morbid anatomy held sway, and the obviousness of certain morbid changes discovered after death led to the belief that these changes indicated the real nature of disease. It was not recognised that many of these morbid changes were merely the terminal stages of a long preceding illness, and that during most of the time such structural changes were not necessarily present. The classification of the morbid anatomist was largely adopted by the physicians, who diligently sought (in the living) for the "physical signs" in order to correlate the signs during life with the morbid state found at death. In consequence of this attitude the present classification of disease in the living has been based upon the morbid anatomy of the dead, and has led to the conception that each individual's ailment can be classified according to a gross pathological and structural change.

The incompleteness of medical knowledge at the present time is clearly shown by the fact that a very large number of patients who consult their doctor and who are incapacitated from work do not suffer from any disease referable to the current classification, or one which can be detected by physical signs. They suffer from disabling symptoms not referable to the disease of any special organ. The cause of such symptoms is frequently unknown, and they therefore cannot be rationally treated. It is only in the advanced cases or in the acute infections that a diagnosis can be made in accordance with text-book descriptions. The majority of patients present few or no physical signs, and these may be mostly referable and due to the disturbance of organs not themselves the primary seat of disease.

The chief signs of the early stage of disease are the complaints of the patients called forth by some distressful sensation. The tendency has been, in the absence of physical signs of disease, to take the more prominent symptom or sensation and consider it to be the disease, and the object to which treatment should be directed, as neuralgia, dyspepsia, anæmia, palpitation, neurasthenia, &c. The use of terms such as these indicates nothing more than the presence of a symptom.

Careful inquiry shows that in the majority of such cases a number of other sensations or symptoms are present, referable to other organs of the body. For example, the patient may complain of palpitation. Inquiry will reveal other symptoms referable to the stomach and intestine, to the nervous and to the muscular systems. When these symptoms are gathered together they are found to show a disturbance of so many different organs that the conclusion is forced that there is a common cause which upsets the balance of the different organs and systems. In some cases the cause can be recognised and dealt with, as in the case of some localised infection, such as an abscess. In most cases, though a single cause of the widespread disturbance can be inferred, it is not possible to identify it.

Many of these causes are transient and are thrown off, as is the case in the trivial ailments which cause a temporary

incapacity. In other cases it would appear that the persistence of such a cause which at first merely impairs the functional activity of an organ may ultimately lead to morbid changes in structure, such as arterial disease, certain diseases of the heart, kidney, and stomach. If these earlier symptoms of disease are to be unravelled, it is necessary that the panel doctor should not be tied down to a diagnosis made in the terms of text-book medicine, and further, that he should be encouraged, for his own advancement in knowledge, to keep a record of each individual case, however trivial it may appear to be.

These records will at first be of little value for statistical purposes, but by forming a continuous medical history of each individual they will enable the earlier symptoms to be correlated with any disease which may develop later. In this way the knowledge at present wanting may be supplied. Recognising this defect in medical knowledge the doctor should not be requested to specify the nature of a patient's illness either in the routine records or when certifying his incapacity for work, unless the doctor recognises with fair certainty the disease from which he suffers. In a large number of cases this cannot be done, and for a doctor to make a practice of giving a name to a complaint in cases where he knows this to be impossible, is not only illogical, but demoralising, and inimical to that clearness of thought which is necessary for that recognition of the defects in knowledge which is the first step to remedy these defects. Where certifying in such cases a patient's unfitness for work, the mere statement that he is unfit should suffice with a reference to the principal facts observed. If further information be needed in particular cases the card index described below will afford it.

In place of the method at present employed for the recording of the patient's complaints we suggest that a system of index cards should be established which should be used in such a way that certain simple but essential facts are recorded, and that these cards should be available for reference both for administrative purposes and still more for tracing the history of the patient's ill-health.

It is not assumed that this method will at once be successfully employed. At first, many of these records will be so badly done that they will be useless, but some will be carefully done, and as the doctors become more experienced their value will constantly increase. If the suggestion given later be adopted, that students before graduation are instructed in the duties peculiar to panel doctors, these records will become of the greatest value, not only for the practitioner himself in his treatment of the case, but also towards building up new material of medical knowledge. The following plan for the observation and recording of the ailments of patients has been worked out at the St. Andrew's Clinical Institute, and is used by the panel doctors there, and we suggest that an explanatory notice in the following form should be sent to every doctor, and that cards should be supplied to him on the lines there indicated.

[*Instructions for the recording of cases.*—Doctors are requested to make a brief note of each patient. The purpose is to keep a record indicating the nature of the complaint. This record will be of value for reference in future illnesses, and will lay a basis for the detection of the early signs of disease. Further notes, added as the case progresses, will be of use in this way, and will also become a record of the effects of treatment.

If the doctor is interested in some disease, these records can be made fuller. The proposed method is provisional, and the Committee would be obliged if individual doctors would send their suggestions for such modifications as would render the method more useful.

Name. Age. Occupation.
Chief complaint.
Associated sensations.
Physical signs.
Provisional diagnosis.
Treatment.
After-history.

These records should be retained by the doctor, and, in cases of patients who transfer, the Insurance Committee should arrange for the transference of these case cards.]

2. *Defective knowledge of drugs.*—The administration of the Insurance Act involves a large expenditure for drugs, and it behoves legislators to have clearly in mind the present state of knowledge in regard to their use. An inquiry will reveal that there is no accurate knowledge as to the effect of a great many remedies, with the result that worthless drugs are given in the belief that they possess certain properties. A careful inquiry will often reveal that many drugs do not possess the properties attributed to them. Indeed, such an inquiry would reveal the uselessness of so many remedies that the money spent upon them is quite unjustified.

There are two difficulties which will for a long time hamper an intelligent therapy: First, the belief of the people that for each ailment a drug or remedy of some kind exists, and the natural desire that something should be given or done. The second difficulty is the belief of the doctor in the efficacy of his remedy. While the real cause of disease is hidden, and its removal therefore impossible, treatment will continue to be directed towards signs and symptoms. As no rational system of instruction in therapeutics is given in the schools, or can be given until the nature of disease and the action of drugs is understood, the doctor is driven for help to an empiric experience, guided often by the statements of the advertising chemist.

These difficulties should be recognised, and while they cannot at present be fully combated, a constant endeavour should be made to place therapeutics on a surer basis. This can be done by the encouragement of research, particularly amongst the panel doctors themselves. Most valuable help, no doubt, has come from the experimental pharmacologist, but what has never been sufficiently recognised is that the action of remedies on healthy organs is often different from that on the impaired or diseased organ. This has been clearly brought out in the case of the heart. For many years large numbers of observations, experimental and clinical, had been made to find out the action of drugs of the digitalis group on the human heart. It was not until it was recognised that such drugs acted in a different manner on the diseased heart from what they did on the normal heart that the form of heart disease in which they were of benefit could be clearly recognised, so that now they can be administered with precision to suitable cases, and withheld in the great number of cases in which they had been given hitherto.

The intelligent recognition of symptoms enables the doctor to watch the effects of his remedies, and as he is the individual who has the best opportunity, his services are necessary to the intelligent prosecution of this research. An arrangement by which his opportunities should be related to the laboratory investigator and hospital physician would render it possible to lay the basis for a rational pharmacopœia. This is no visionary suggestion, but one which has already been carried out on a limited scale with gratifying success.

As the vast number of panel doctors cannot undertake themselves such an inquiry, it is suggested that certain investigators should specially study those remedies most in vogue with the panel doctors, and after each drug has been carefully studied and its properties understood, and the cases suitable and unsuitable for its use have been determined, a short note, such as the following, conveying this information should be sent to each panel doctor:—

[*The use of digitalis.*—Digitalis is only of use in those cases of heart failure where the exhaustion of the heart is due to an excessive rate. It acts by slowing the rate, so that each beat is more efficient. There are only a few forms of increased rate in which it has this effect; when the heart's rhythm is regular and normal and the increased rate is due to some exciting agent, as fever, digitalis is practically without effect. Its use is specially indicated where the heart's rhythm is irregular as well as rapid, especially in the condition due to auricular fibrillation. Here the irregularity is very disorderly, small and big beats occurring with no kind of orderly sequence.

In such cases the drug should be given in full doses, and pushed till an effect is produced, the effect being a marked decrease in the heart's rate, nausea, or diarrhœa, or a sense of oppression across the chest. When these signs appear the drug should be stopped. If the heart's rate has decreased the drug should be given when the rate begins to increase in just sufficient amount to keep the rate between 70 and 80. If there is no decrease in the rate, but nausea, &c., then the drug should not be resumed. The tincture is the most serviceable form. It should be given to the adult in doses of 15–20 m., so that one drachm is taken in one day. The effect may be looked for in from four to seven days.]

The detailed results of these investigations should be published so that the reasons for the conclusion should be available. In this way there would be gradually built up a pharmacopœia of practical value.

3. *Defective knowledge of prognosis.*—A problem which constantly confronts a doctor, and one which is of the greatest importance in the working of the Act, is to assess the condition of the patient in relation to (1) his capacity for work, and (2) his future history.

(1) The present great deficiency of this knowledge was demonstrated during the war, when it was clearly shown that the knowledge did not exist which would enable doctors to classify men according to their capacity for work. It is manifest that, as the panel doctor has to certify a man's capacity or incapacity for work, there is urgent need for this kind of knowledge. The information necessary can only be gained from the systematic observation and examination of a large number of individuals carrying on their usual occupation, and this can only be done by the general practitioner, whose occupation provides the opportunities for systematic observation of this kind. The need for this kind of knowledge is forced upon every panel doctor. He has to decide whether a man is fit for his work. He may have to recommend him to receive sick pay, and he often has to determine whether the patient's occupation is detrimental to the health. It will be seen that his decisions involve the expenditure of large sums of money, and may influence the kind of life and occupation that many must follow.

(2) This misapprehension of the significance of signs and symptoms leads directly to much useless expenditure of money and the unnecessary interference with a man's work. This is particularly shown in the detection of some common

sign, as a cardiac murmur or albumin in the urine, medical knowledge not yet having advanced so far as to be able to recognise the significance of these signs, with the result that many healthy people are thrown on the sick list.

Investigations to remedy this defect should be undertaken by the general practitioner, as he is the only person who has the necessary opportunity. Steps should be taken to give facilities and instruction to such as are desirous to help in this matter. At the St. Andrew's Institute, investigations with this object are being carried out along the lines indicated, and it is proposed to collaborate with other doctors in this investigation. We suggest that from time to time brief notes of the results which are being obtained should be issued. The following is an example of the information which should from time to time be issued upon the prognostic significance of special symptoms.

[*The significance of systolic murmurs.*—It should be understood that the healthy heart can exhibit murmurs which are physiological in origin or are of so slight significance as to be negligible so far as the efficiency of the heart is concerned. These murmurs are always systolic in time and heard loudest at the apex, mid-sternum, or base of the heart. If the person can undertake such effort as we recognise to be compatible with his age without experiencing any distress (breathlessness or pain), and if the heart be normal in size or only slightly enlarged, then, for all practical purposes, the cause of the murmurs has nothing to do with any incapacity from which he may suffer.

If in response to effort the patient becomes exhausted, without breathlessness or cardiac pain, then the cause of his ill-health is not primarily cardiac, for exhaustion is not a sign provoked by a failing heart.]

The Teaching of the General Practitioner.

It is a remarkable fact that though the vast majority of medical students become general practitioners no attempt is made to teach them how to make use of their opportunities in general practice, and no hint is ever given them that the phases of disease which they will meet will be different from that which they have seen in the hospitals. There is an urgent need for a definite course of teaching and training students in their last year how they should conduct their practices as panel doctors. If there was a scheme by which they could learn how to question a patient intelligently, how to make short but accurate notes, how to watch the patient as he passes from one phase of disease to another, the working of the Insurance Act would, year by year, be greatly facilitated, while a great impetus would be given to the investigation of these dark fields of medicine which only the general practitioner can explore.

Central Clinics.

The recognition of the great defects in medical knowledge to which reference has been made—viz., diagnosis treatment, and prognosis—has led to the putting into effect a scheme to make good these defects. As it has also been recognised that these defects cannot be made good without the aid of the general practitioner, the basis of the scheme is to train him to make use of the opportunities which he and he alone possesses. It was also recognised that this object could be combined with means for affording the panel doctor facilities for the better carrying out of his duties towards his patients.

A building was therefore secured in which investigations could be carried on by the trained general practitioner, in association with the laboratory facilities for bacteriology, chemistry, and X rays. While each general practitioner examined his own patients, each one made a more particular study of a special subject, one, for instance, making himself familiar with the diseases of the nervous system, another with disease of the circulatory system, and so forth.

The system of specialisation at present prevalent enables the specialist only to see disease at a late stage. Moreover, as in ill-health there are reactions affecting several organs or systems, a man who restricts himself to the study of but one organ or system cannot acquire the power of detecting the primary cause of the patient's ill-health. We recognise that a general practitioner who makes a special study of the diseases of one organ or system is better qualified in that he has a wider experience, and can therefore take a broader outlook of his patient's complaint, besides having an opportunity for seeing the disease at an early stage.

In the St. Andrews Institute each panel doctor has a room, and arrangements are made for him to see his panel patients there. He has the use of the laboratories, and he can call upon his colleagues and consult with them on those cases of which they have made a special study. The great advantage of such a scheme is manifest. It is practicable, and the idea can be extended so that all the different health authorities could be in the same building and the facilities of one branch could be used by the other branches.

Methods Pursued at the St. Andrews Institute for Clinical Research.

1. Each clinician has a private room in the institute. This is reserved from 11 to 1 on Mondays, Wednesdays, and Thursdays for research cases. During the rest of the day each practitioner may use his private room as a private consulting-room. Two panel practitioners have adopted this plan for all their patients. They have thus the advantage of the use of the scientific departments whenever required. An index-file and cards are provided in each room upon which brief notes are kept of each private or panel patient. These cards will, in time, form records of the life-history of each patient. In the event of a patient removing to another district these notes can be sent to his new attendant.

2. Cases for research are selected from his own practice by each member of the clinical staff. These are, in the first instance, seen by him, and he is at liberty to consult Sir James Mackenzie or any colleague at any stage of the case. If any special investigations are required, these are carried out by the staff of the special departments.

3. On Tuesday afternoons some special subject, arranged beforehand, is discussed by a general meeting of all members of staff.

4. On Friday afternoons the whole staff discuss the cases seen during the week, and any suggestions for investigation of any case made at that meeting are proceeded with and added to the record.

Summary.

1. The present phase of medical knowledge is defective, because the classification of disease is largely based upon pathological changes discovered after death, which bear little or no relation to the clinical manifestations of ill-health and no relation to the early symptoms of disease which occur before structural changes can be recognised.

2. Advance in knowledge along the right lines can only be effected by making use of the opportunities of the panel doctor.

3. Encouragement must be given to the panel doctor to make use of his opportunities for improving medical knowledge by: (*a*) Encouraging him to keep brief records of his cases and of the symptoms presented on the lines indicated; of the effect of treatment upon them, and of the continuous history of his cases. (*b*) By issuing to him from time to time notes upon the mechanism and the significance of symptoms.

4. By improvements in medical education in affording some instruction on clinical medicine as studied and treated in general practice as apart from its study under hospital conditions.

5. In view of notes of cases kept by a practitioner as indicated, certificates of fitness or unfitness for work should be accepted apart from a definite diagnosis in the numerous cases in which a true diagnosis is not as yet attainable.

6. By the coördination of workers, clinical and laboratory, the progress of medicine can be favoured, and the more skilful treatment of panel patients facilitated.

URBAN VITAL STATISTICS.

(Week ended July 31st, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·9, 9·9, and 9·8 in the three preceding weeks, was again 9·9 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·5, or 0·4 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 2·9 in Edmonton, 3·8 in Carlisle, and 5·2 in Lincoln, to 15·4 in Blackpool, 16·1 in Barnsley, and 16·8 in South Shields. The principal epidemic diseases caused 199 deaths, which corresponded to an annual rate of 0·6 per 1000, and comprised 90 from infantile diarrhœa, 37 from diphtheria, 33 from measles, 24 from whooping-cough, 9 from scarlet fever, and 6 from enteric fever. Measles caused a death-rate of 1·6 in Middlesbrough, but the mortality from the remaining diseases showed no marked excess in any of the towns. There were 1956 cases of scarlet fever and 1481 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1911 and 1556 respectively at the end of the previous week. The causes of 23 of the deaths in the 96 towns were uncertified, of which 4 were registered in Birmingham and 3 in South Shields.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 12·1, 11·1, and 11·6 in the three preceding weeks, fell to 11·2 per 1000. The 235 deaths in Glasgow corresponded to an annual rate of 11·0 per 1000, and included 13 from small-pox, 6 from infantile diarrhœa, 2 from whooping-cough, and 1 each from measles, scarlet fever, and diphtheria. The 54 deaths in Edinburgh were equal to a rate of 8·3 per 1000.

Irish Towns.—The 107 deaths in Dublin corresponded to an annual rate of 13·4, or 0·6 per 1000 above that recorded in the previous week, and included 3 each from whooping-cough and from infantile diarrhœa and 1 each from measles and from scarlet fever. The 104 deaths in Belfast were equal to a rate of 13·1 per 1000, and included 4 from infantile diarrhœa.

THE ROYAL SANITARY INSTITUTE:

BIRMINGHAM CONGRESS, JULY 19TH–24TH.

LAST week we briefly reported the Sections of Preventive Medicine and of the Hygiene of Child Welfare, and we return now to an important discussion on

INDUSTRIAL EFFICIENCY AND FATIGUE,

which took place on Tuesday, July 20th, in the *Section of Industrial Hygiene.*

Three factors are coming to be recognised as fundamental in relation to the future development of medicine in this country: one is, that prevention is more important than cure; the second, that over-fatigue is the most potent influence conducing to ill-being, lowered resistance, and final breakdown; the third, that our national life is essentially based on industry, which is ever drawing into its net an increasing proportion of the population, male and female.

Mr. NEVILLE CHAMBERLAIN, as President of the section, in an inaugural address, gave an admirable and condensed sketch of the rise of industrialism and of the rank weeds of long hours and of the exploitation of child labour which sprang up alongside the good seeds of labour-saving devices and threatened almost to ruin the harvest. The lurid light of those early stages of development is now sinking into obscurity as the laws underlying human efficiency are coming to be known.

Professor E. L. COLLIS, a member of the Industrial Fatigue Board, summarised the position of knowledge to-day. He pointed out that, while the human body may be considered as a machine which requires fuel in the form of food to enable it to perform work, it is a living machine, the structure of which is in a constant state of metabolic activity, building itself up and breaking itself down; that the internal activity of building up—so-called rest—is a direct incentive to the external activity of breaking down or work; that work is even more necessary to health than rest; that fatigue, the result of sufficient work, is a healthy phenomenon, the forerunner of healthy rest; but that without sufficient rest over-fatigue results which manifests its presence as ill-being, physical and mental—a lowered capacity for work and for resisting sickness, associated with bad temper and discontent. Physical work which is performed by the muscles is directed by the brain; both muscular and mental activity steadily increase with practice which, if uncontrolled, would bring the organism to a state of excessive exhaustion. This state is guarded against by the mechanism which transmits messages to the muscles; here, in the synapse in the spinal cord through which the efferent impulses must pass, a block arises; the coming into existence of this block (while both muscular and mental activity may be increasing through practice) constitutes the onset of fatigue. Over-fatigue lowers industrial efficiency and the standard of well-being; thus the objectives of maximum production and maintained health depend on its avoidance. The interests of national productivity and of national health are in this matter the same—the avoidance of over-fatigue. When output is increasing hour by hour during the day, and day by day throughout the week, there can be no accumulation of fatigue; ill-health is then kept at arm's length. When output is falling off as the day lengthens, and as the week progresses, fatigue is accumulating, *joie de vivre* is diminishing, discontent is appearing. Much could be done to improve efficiency and prevent over-fatigue. Labour turnover, an economic waste which in factory employment alone places upon industry a yearly burden of some 40 million pounds, due to the rolling stones of labour trying to find round holes to fit into, is productive of much unnecessary inefficiency and over-fatigue. It can easily be reduced 70 per cent. and probably more by medical and psychological selection of workers for work, instead of adhering to haphazard, come-and-go-as-you-please methods of engagement by trial and error. Workers should be fitted to their work; taught their work; clothed for their work; provided with suitable food and stimulated to personal hygiene. Work should be fitted to the worker: ventilation made effective; lighting made adequate; tables, benches, tools and machines constructed to suit each worker; periods of work and of rest scientifically planned. What is required is a right understanding of work in relation to the human machine, and attention to this machine, its possibilities and reactions, its medical and psychological aspects. Then well-being and contentment, skill, and production will be increased, while chronic fatigue and discontent, inefficiency and poverty will be decreased.

Welfare Work in Industry.

Miss A. M. ANDERSON, Principal Lady Inspector of Factories, next dwelt on the progress which is being made, and pointed out how the newer welfare movement is a coördinated effort to improve the personal health and life of the industrial worker, an effort directed by Government orders based on scientific research. A new science and art of labour, and of its management, is coming to light, aimed at securing health and welfare in the workplace, and quantity and quality in output; aims rendered possible by "fearless work and hopeful rest," the result of whole-hearted coöperation between capital and labour. Here is hope for a true international, an international of industry; and it may be noted that in the field of research this era is dawning, for the Comité d'Hygiène of France, the American Committee on Fatigue, and our own Research Board are in close touch, M. Langlois and Professor Lee both attending a recent meeting of the board in London. Hippocrates said the art of healing and the "love of man"—the whole welfare of humanity—are identical. Here the nations can gather in amity in pursuit of investigations into humanity aimed at saving fatigue, lightening labour, ensuring safety, rendering first-aid, and ameliorating social conditions. Thus morbidity and premature mortality, bred of over-fatigue and sloth, will give way to health, the child of work and rest.

Mr. W. B. WELCH, welfare supervisor at Birmingham Small Arms Company, contributed a short paper of great interest not only for its contents but as being an instance of the useful work which can be done at individual factories by those possessing the spirit of inquiry. In particular he gave data which showed that the effect of gymnasium work on growing lads was to increase their stature by the time they reached the age of 18 by 3½ inches, their weight by 14 lb., and their chest expansion by 1¼ inches; and also that the tendency among boys to stay in employment, rather than to move on, increased with age from 14 to 18.

Other papers were also read, one by Dr. W. A. DALEY dealt with the physique and working capacity of Liverpool dock labourers, and another by Surgeon-Commander R. J. MACKEOWN was devoted to the health of seamen and the need for safeguarding it.

Three papers of particular medical interest read in other sections merit further notice.

PROTECTIVE VACCINES IN INFLUENZA.

In the *Section of Preventive Medicine* Dr. W. H. WYNN read a paper on the Use of Vaccines for the Prophylaxis and Treatment of Influenza. The true value of vaccines for prophylaxis against epidemic influenza cannot, he said, be established until the morbidity of a large sample of the population, inoculated *before* an outbreak, as compared with that in uninoculated controls is submitted to expert statistical treatment. At present there is no agreement between bacteriologists as to the true virus of influenza, and the use of a vaccine is necessarily empirical, but there is general consensus that a vaccine for prophylaxis or treatment should contain several strains of Pfeiffer's bacillus, pneumococci and streptococci. Lasting immunity requires large doses, but such doses may produce unpleasant local or general reactions. These are relatively unimportant when occurring in selected individuals or groups of individuals, such as soldiers, who can rest for a day or two after an injection. The production of a long period of immunity outweighs the trifling disadvantages. But when, as with influenza, it is desirable to protect as

many as possible of the general population, unpleasant reactions, if possible, should be avoided. Immunity during an epidemic period of a few months only is aimed at, and this may be obtained with smaller doses, which will not produce reactions sufficient to interfere with work. Where, however, reactions are not objected to, it would be wiser to give the larger doses. Improvements in the manufacture of the vaccine may, in the future, enable large doses to be given without discomfort, and the experience with vaccine suspended in oil is suggestive of this possibility.

Author's Experience.

Dr. Wynn's own preference has been for a vaccine containing equal numbers of influenza bacilli, pneumococci and streptococci of several strains, and, so far as possible, from primary cultures. At first he gave 100 millions of each as a first dose, followed by 200 millions in seven days, but he now advocates a first dose of 200 millions and a second of 400 millions. In several instances a third dose of 800 millions and a fourth of 1200 millions have been used. By giving three or four increasing doses there is less reaction than by giving two large doses, and the final dose is the same.

"Over 1000 persons were injected with this vaccine, and I have a record of the result in 680. Of these, only 14 developed influenza, 4 of these only after three months. In all, the disease was mild, and there was no pneumonia. With most of these it is unfortunately impossible to compare them with uninoculated controls. The vaccine was used by many doctors under various circumstances. A common practice was to inject all the other members of a household in which there was a case of influenza. In one village there were two large preparatory schools. In one no vaccine was used, and nearly every boy, master, and servant suffered from influenza. In the other, 75 boys and 38 adults were injected. All escaped except one master, who was injected after infection had occurred. In the village, in which influenza was very prevalent, 31 adults and 16 children were injected and all escaped. At one hospital 117 nurses and maids out of 170 were injected in the autumn of 1918, at the beginning of the outbreak. Of the 53 uninoculated, 25 had mild attacks in the previous June, and all escaped subsequent infection during the autumn epidemic. Of the 28 presumably unprotected, 14 suffered from influenza, 2 having severe broncho-pneumonia, and 1 died. Of the 117 injected, 112 had two injections and 5 only one. Of the 112, 2 had mild attacks. Of the 5, 1 had a mild attack and 1 severe broncho-pneumonia."

American Experience.

Dr. Wynn went on to summarise the experience of protective inoculation in America, where it was practised on a large scale. Rosenow used a vaccine with the formula—pneumococci, 3000 mill. (type 1, 1500; type 2, 2750; type 3, 3500; type 4, 1250); *B. influenzæ*, 500 mill.; staphylococcus, 500 mill.; *Streptococcus hæmolyticus*, 1000 mill. in 1 c.cm.; ½ c.cm. was given as a first dose, and then 1 c.cm. and 1·5 c.cm. at intervals of seven days. In institutions 8306 were injected three times and 9388 were uninoculated. The incidence of influenza among the inoculated was 31 per 1000 and among the uninoculated 200 per 1000. The incidence of pneumonia was 1·0 and 12·0 respectively. Among the general population 93,467 received three injections, the influenza incidence was 87·9 per 1000 and of pneumonia 4·4 per 1000, as compared with 281·8 and 21·0 per 1000 among the uninoculated. Taking all the results, the average mortality rate in the inoculated was one-fifth of that in the uninoculated.

Dr. Tonney, of the Department of Health, Chicago, using Rosenow's vaccine, reported that of 44,494 not vaccinated there were 1039 cases of influenza, with 95 pneumonias and 60 deaths. Of the 2584 vaccinated once there were 14 cases of influenza, but of 1636 receiving a second injection there were no cases. Among the vaccinated there were 3 cases of pneumonia, but no deaths.

Minaker and Irvine, in San Francisco, used a vaccine containing 5000 mill. influenza bacilli, 7000 mill. pneumococci (3000 mill. each of type 1 and 2, 1000 mill. of type 4), and 100 mill. *Streptococcus hæmolyticus* per c.cm., 0·5, 0·8, and 1·0 c.cm. were given at three-day intervals. The final dose was, therefore, 12,100 mill. organisms. The results are set out in the following table. The civilians were inoculated before Oct. 16th, 1918, three weeks after the epidemic began, and before it reached its height, and the marines before Oct. 20th. The results are given up to Dec. 1st, when the epidemic had subsided. The naval men were not injected until Nov. 15th.

—	No.	Influenza.		Mortality	
		No. of cases	Per cent.	No.	Per cent.
Uninoculated—					
San Francisco and Oakland	625,000	33,065	5·3	3035	9·2
Mare Island Navy Yard	8,232	1,296	15·7	65	5·0
Nurses and attendants in hospitals	530	186	33·8	4	2·1
Los Angeles	600,000	9,124	1·5	612	6·6
Inoculated—					
San Francisco civilians	1,080	14	1·4	0	0·0
Marines at Mare Island	1,950	35	1·8	1	2·8
Hospital men on duty in influenza wards	270	9	3·5	1	11·0
Naval Camp, San Pedro	3,100	53	1·7	0	0·0

Sherman, using a vaccine very similar to the one I have advocated, gave prophylactic inoculations to 9000 employees in large works in Philadelphia at the beginning of the epidemic, and only 5 were reported to have contracted influenza. He also gives the reports from 39 doctors using the same vaccine; 41,260 persons received one to four injections. Of these 963 contracted influenza, with 23 deaths, making a mortality rate of 0·57 per 1000 inoculated, as compared with from 5 to 25 per 1000 inhabitants in various parts of the country among those not inoculated. Wood, medical director of the Willard Storage Battery Co., of Cleveland, immunised over 3000 persons at the beginning of the epidemic. Less than 1 per cent. contracted influenza, and none died.

Watters, of Massachusetts, used a vaccine containing *M. catarrhalis*, pneumococcus, and *Streptococcus hæmolyticus*, of each 400 mill., *B. influenzæ* 100 mill. per c.cm.; 2 c.cm., 3 c.cm., and 4 c.cm. were given at three-day intervals. Of his laboratory staff of 14 10 received inoculations and all escaped; of the other 4, 2 had severe influenza. Public clinics were opened and inoculations given free of charge, and vaccine was sent to many boards of health and large works. Some of the results may be summarised as follows:—

—	Number.	Influenza, per cent.	Influenza mortality, per cent.
H. P. Hood Milk Co.:—			
Not inoculated	300	31·0	4·3
Inoculated	247	6·8	0·0
Boston Confectionery Co.:—			
Not inoculated	200	30·0	2·7
Inoculated	250	0·8	0·0
F. H. Roberts Co.:—			
Not inoculated	339	2·7	11·0
Inoculated	329	0·9	0·0
Allentown State Hospital:—			
Not inoculated	575	32·4	17·7
Inoculated	722	8·4	15·1

Watters, combining all his records, including the above, found that the disease incidence among the inoculated was approximately 3·5 per cent., while at the same time among others not inoculated and under similar surroundings the incidence was 28 per cent. The only deaths among the inoculated were among patients in the Allentown State Hospital, and of the 8 deaths 3 patients had only received one injection, and 3 only 2.

The Ministry of Health Vaccine.

In England Dr. Wynn considers there has been an unnecessary fear of large doses, and the formula originated by the War Office Conference contained only 60 mill. *B. influenzæ*, 80 mill. streptococci, and 200 mill. pneumococci in 1 c.cm., and it was advised that ½ c.cm. be given as a first dose, followed by 1 c.cm. after ten days. The initial dose was smaller than he used for treatment in influenzal broncho-pneumonia. Nevertheless, the result in the army showed that this vaccine gave some measure of protection. Leishman gave the following summary of results:—

—	Number.	Incidence per 1000.	Pulmonary complications per 1000.	Deaths, per 1000.
Inoculated	15,624	14·1	1·6	0·12
Not inoculated ...	43,520	47·3	13·3	2·25

It would be seen that the incidence of influenza among the non-inoculated in the army, 14·1 per 1000, was much less than the 50 to 300 per 1000 recorded in the American figures above, so that apparently a less severe type of disease was experienced in the particular army units concerned.

The vaccine now recommended and adopted by the Ministry of Health contains 400 mill. influenza bacilli per c.cm. instead of 60 mill. There is no explanation as to why this formula was adopted. It has met with much criticism, and the American experience, as well as that of those who have been using mixed prophylactic vaccines for years, seems to have been ignored.

It might be thought inadvisable, Dr. Wynn said, to inject persons suffering from chronic infections, but experience has shown that there is rarely any harm in injecting patients with chronic bronchitis, sinusitis, or arthritis. Pregnant women can safely be injected, and also infants, in spite of the advice from the Ministry of Health that the vaccine should not be given to children under 3 years of age. Children respond to vaccines very well, and he had no hesitation in giving suitably reduced doses to children under 3 years of age.

The second half of Dr. Wynn's paper was devoted to a consideration of vaccines in the treatment of a developed attack of influenza.

THE PROBLEM OF STILLBIRTH.

In the section devoted to the hygiene of maternity and child welfare Mr. BECKWITH WHITEHOUSE read a paper on the Medical Aspects of the Stillbirth Problem. The question, he said, was one of great national importance. The last report issued by the medical officer of health for Birmingham stated that during the year 1918 590 stillbirths occurred in the city—that is, 3·4 per cent. of all births. This figure did not include the large addition of babies who died within a few hours or days after birth from injuries and conditions directly dependent upon their entry into the world. What were the causes which underlay these facts? Were they sociological, depending upon such factors as housing, occupation, feeding, social status? Were they the result of constitutional disease in the parents or fœtus, or, on the other hand, were they directly dependent upon various obstetric complications?

Sociological Factors.

The Public Health Department in Birmingham had commenced an investigation into the causes of stillbirth, 440 cases having been followed up in schedules issued by the medical officer of health.

From these it appeared that there was little difference between the number of stillbirths in the poorer and least healthy parts of the city and that in the residential and healthiest wards. The average of the poorest was 37, and that of the healthiest 38. Industrial work on the part of the mothers did not appear to react unfavourably on the incidence of stillbirths, for in 411 cases, 242 of the mothers were occupied at home and 169 were employed industrially. Of the latter 64 were at work for six months or more of the pregnancy, whilst 17 only were at work for less than three months. Legitimacy was not an important factor, since in 333 instances the baby was legitimate. In only 24 was it illegitimate. Housing and overcrowding appeared to have some influence, for the proportion of stillbirths occurring in houses with from three to six rooms was 39·5, against 34 in houses with from seven to eight rooms or over. These figures were a strong argument in favour of increased institutional accommodation for pregnant women.

Constitutional Factors.

Syphilis was still regarded as being a very potent factor in the production of intra-uterine fœtal death. Mr. Whitehouse investigated collectively the obstetric histories of the women who had attended the venereal clinic at the General Hospital during the past year, and found that out of a total of 209 women 566 children had been born alive, whilst the stillbirths numbered 64, a proportion of 10 per cent. of the total. A fallacy was present in this gross number, since in many cases syphilis was contracted late in the obstetric life of the individual patient and cannot have had any influence upon the previous pregnancies. Ninety-three cases of tertiary syphilis had been collected, and amongst these women 293 children were born alive and 51 stillborn, a percentage of 15. A very striking feature was revealed during the investigation—namely, the very high infant mortality attached to the children of syphilitic parents from causes not necessarily actually due to the disease itself, but pointing to lowered general vitality. Although the pregnancy terminated in the birth of a living and often premature but viable child, and therefore could not be labelled "stillbirth," the infant did not survive, and therefore fell into that large group of "potential stillbirth." Syphilis in the parents, if untreated, therefore, not only increased the risks of fœtal intrauterine death, but to a marked degree diminished the chances of survival after birth. During the past year 25 women suffering from syphilis had been treated during their pregnancy at the General Hospital and admitted for their confinement. Amongst these patients no stillbirth occurred. By treating energetically throughout her pregnancy every expectant mother suffering from syphilis, either active or latent, it was possible greatly to diminish the risk of stillbirth from this cause.

Factors Concerning Fœtus and Delivery.

Mr. Whitehouse went on to deal with factors concerned with the fœtus and method of delivery, referring to the figures of the Birmingham Maternity Hospital for the past ten years.

During the period 1910–1919 inclusive 5591 infants were born in this institution. Of these 4876 were born alive and 715 dead, a percentage of 12·7. Of the latter a cause of antenatal fœtal death is assigned in 653 cases (91·4 per cent.) and unknown in 62 (8·6 per cent.). These results are expressed in Table I.

Live and Dead Births at Birmingham Maternity Hospital in Ten Years.

Total number of infants born		5591
Infants born alive		4876
Stillbirths		715 (14·6%)
Cause of stillbirth known		653 (91·4%)
Cause of stillbirth unknown—		
Macerated fœtus, &c.	62	(8·6%)

Analysing the known causes of stillbirth in the 653 available cases it is possible to classify the material as shown in Table II.

Known Causes of Stillbirth.

Constitutional maternal diseases	18	Anomalies of umbilical cord	27
Prematurity	30	,, placenta	256
Toxæmia	94	Obstructed labour	192
Anomalies of fœtus	36		
			653

The undue proportion existing between these individual items led to a more detailed analysis of the actual pathological conditions present.

Analysis of Pathological Conditions.

Constitutional maternal disease:			
Mitral disease	11	18	653
Chorea	1		
Cancer of cervix uteri	1		
Ovarian cyst	1		
Exophthalmic goitre	1		
Meningitis	1		
Transverse myelitis	1		
Encephalitis lethargica	1		
Prematurity:			
Prematurity	26	30	
Premature rupture of membranes	1		
Twins	2		
Triplets	1		
Toxæmia:			
Eclampsia	64	94	
Albuminuria	27		
Hyperemesis	3		
Anomalies of fœtus:			
Hydramnios	19	36	
Hydrocephalus	6		
Anencephalus	7		
Atalectasis	1		
Fœtal ascites	1		
Spina bifida	1		
Fœtal heart disease	1		
Anomalies of umbilical cord:			
Prolapse of cord	25	27	
Cord round neck	1		
Thrombosis of cord	1		
Anomalies of placenta:			
Placenta prævia	205	256	
Antepartum hæmorrhage	51		
Obstructed labour:			
Obstructed labour (forceps)	85	192	
Craniotomy	50		
Malpositions (version, &c.]	49		
Cæsarean section	8		

In considering the items set forth above three facts are at once evident: (*a*) The very high fœtal death-rate from placenta prævia. (*b*) The danger to the child in obstructed labour, whether due to malposition or to disproportion between the fœtal head and pelvis, and whether forceps or version are employed in such a contingency. (*c*) The great risk to the fœtus in eclampsia.

Placenta prævia thus accounted for 31 per cent. of the total, a very high proportion, and this does not represent the total fœtal mortality, for an addition is required in respect of the children born alive, but who subsequently die from injuries received at birth. Of the 317 cases of placenta prævia admitted to the hospital 212 babies were stillborn and 33 died in hospital, giving a gross fœtal mortality of 77 per cent. The methods of delivery were as follow:—

Methods of Delivery in Placenta Prævia.

Method.	Cases.	Fœtal death.	Percentage.	Maternal death.	Percentage.
Version	211	193	91·4	9	4·2
Natural	35	16	45·7	0	0·0
De Ribes's bag	15	11	73·3	3	20·0
Rupture of membranes	11	9	81·8	0	0·0
Forceps	9	9	100·0	2	22·0
Cæsarean section ...	5	2	40·0	3	60·0
Vaginal Cæsarean section	4	2	50·0	0	0·0
Induction	2	1	50·0	0	0·0
Extraction of breech	2	1	50·0	0	0·0
Vaginal pack	1	0	0·0	0	0·0
Hysterectomy	1	1	100·0	1	100·0

The favourite method of treatment for placenta prævia is *version*, with a fœtal mortality in this complication of 91 per cent. and a maternal mortality of 4 per cent. The next method of election, if the case is so urgent that it cannot be left to nature, is the use of de Ribes's bag; here the fœtal mortality is 73 per cent. and the maternal 20 per cent. Mr. Whitehouse is of opinion that improvement can be effected in the treatment of placenta prævia by the more general substitution of Cæsarean section for version and the other methods at present in use. During the 10 years it was performed 162 times at the hospital, with varying indications, pre-arranged and emergency, the total mortality from all causes being only 5·5 per cent.

Risk to the child from obstructed labour could only be diminished in numbers by careful clinical examination before labour actually commences. Here antenatal clinics might play an all-important part. If the medical profession, as a whole, was too occupied to expend the necessary time in investigating individual cases of pregnancy the State must accept the responsibility of providing more antenatal clinics, where such work could be carried out by routine. The reward would undoubtedly be an appreciable lowering of the stillbirth figures.

DOMESTIC ANIMALS IN THE SPREAD OF INFECTION.

At the Conference of medical officers of health Dr. W. G. SAVAGE, medical officer of health for the county of Somerset, dealt with three examples of alleged association between human and animal disease.

Bovine mastitis was a rather common condition, the chronic form being usually due to the tubercle bacillus, or less commonly to actinomycosis. The prevalence of cows with tuberculous udders was probably round about 1 per cent. The association of the acute variety with human disease had required a good deal of unravelling. Of 35 acute cases investigated by Dr. Savage for the Local Government Board in 1907–08, over 70 per cent. were due to streptococci, 16 per cent. to staphylococci, 1 to *B. coli*, and the rest of doubtful bacteriology. The *Streptococcus mastitidis* closely resembled the pathogenic streptococci of man, as found in cases of sore-throat, in morphological and cultural characters, but differed from them in pathogenicity, being of low virulence to animals. And yet extensive outbreaks of sore-throat and other septic conditions had been traced to milk infected from cows suffering from mastitis. He had described over 20 outbreaks of these diseases due to milk, in a good many of which the cause was traced back to cows suffering from this condition, one such outbreak, which was fully investigated, involving over 600 cases and definitely traced to an infective cow. The explanation of this apparent inconsistency was that the cases in which a virulent type of organism occurred were examples of infection of the cow from a human source.

In 1911 and subsequent years outbreaks occurred in Boston, Chicago, Baltimore, and other cities which led to a differentiation of the human type of streptococcus in bovine mastitis by means of hæmolytic tests. The strains dangerous to man were always found to be hæmolytic, while the streptococcus of ordinary bovine mastitis was non-hæmolytic. Davis and Capps had shown that hæmolytic streptococci of human origin might cause mastitis lasting for several weeks in cows, the streptococci gaining access from an infection from the milker, whose hands were contaminated, perhaps, from a sore-throat. In an outbreak in Boston in 1917 (reported in January, 1920, by Brown and Orcutt) it was possible to identify the particular infective strain both from the mastitis fluid and from the sore-throats of the sufferers.

Outbreaks of Food-poisoning.

Food-poisoning outbreaks were all, or almost all, due to a secondary infection of sound food with members of the Gaertner group, the infecting agent being either *B. enteritidis*, *B. suipestifer*, or *B. aertrycke*. In a proportion of cases it was due to infection of the living animal with one of these bacilli.

In only a few of the recorded British outbreaks was there direct evidence of disease in the animals supplying the peccant food. In several cases where milk had been the vehicle the condition was traced back to infection of the cow with a member of the Gaertner group. The only two instances spread by meat from a diseased animal were those at Murrow and at Limerick. Continental outbreaks showed this association much more frequently.

Animals suffering from Gaertner group infection might recover from such conditions, but the bacilli persist, the animals acting as carriers, and undoubtedly a number of outbreaks had originated from the meat of sound animals being infected, by splashing and so forth, from the intestinal contents of such carrier cases.

In connexion with the secondary infection of food the importance of rats and mice must not be overlooked, since those animals frequently were infected with Gaertner group bacilli, and might act as a vehicle of infection.

Diphtheria and Cats.

That cats might be attacked with human diphtheria, or act as carriers of the bacilli, and so spread this disease, was a view very widely accepted amongst medical men and in the text-books. The author's investigations were along three lines. The examination of the throats of healthy cats and kittens quite unassociated with cases of human disease showed that in the swabs from the latter no organisms like diphtheria bacilli were detectable, but that from no less than five out of eight healthy cats bacilli were found growing on the cultivation media, which morphologically very closely resembled diphtheria bacilli, and which could not be distinguished from that organism in the films from the cultures. One cat re-examined three months later still showed these organisms. When they were isolated and their characters studied in pure culture it was manifest that they were not true diphtheria bacilli, nor were those tested pathogenic. All the cases mentioned above, where diphtheria bacilli were reported as found in the throats of cats associated with human disease, rested upon morphological appearances alone and never upon isolation and identification, and therefore were completely valueless in view of the above findings. A second line of inquiry was the examination of cats actually closely associated with human cases of diphtheria, and here, in several instances, as might be anticipated from the findings in healthy cats, bacilli morphologically indistinguishable from diphtheria bacilli were found in the cultures from the swabs. When isolated and fully investigated, however, none were found to be true diphtheria bacilli. The third line of investigation involved the experimental inoculation of kittens, to see if it was possible to infect them with diphtheria bacilli by natural channels. As many as 19 different experiments were carried out, and 10

different strains of human diphtheria bacilli were used, the virulence of four of them being fully tested.

"Massive and repeated feeding with highly virulent cultures (in one case on 11 occasions) were quite without effect. Kittens whose throats were inoculated by swabs with enormous numbers of diphtheria bacilli, either alone or mixed with staphylococci and streptococci grown direct from human cases of diphtheria, remained unaffected, and the bacilli had disappeared within 24 hours. The possibility that the failure to infect the kittens was due to the absence of a local nidus of growth was met by creating such a nidus by a preliminary scarification of the throat, and with other animals by painting with strong silver nitrate solution. Subsequent massive inoculation with diphtheria bacilli still failed to produce any infection or, what was remarkable, any persistence of the bacilli locally. The same striking fact was brought out by a series of nose-swabbings with heavy doses of diphtheria bacilli. In every instance the bacilli rapidly disappeared, and neither local nor constitutional symptoms resulted. These results were exceptionally uniform and concordant. It was found impossible either to infect the kittens or produce a carrier condition, even one of very short duration."

The whole series of experiments led Dr. Savage to the opinion that the common and widely accepted view that cats could suffer from a naturally acquired disease caused by the diphtheria bacillus was entirely without foundation. The reported cases of such an association were based upon insufficient examination and differentiation of the bacilli found, due to a failure to realise that a large proportion of healthy, normal cats contained in their throats bacilli closely resembling, and difficult to distinguish from, the true *B. diphtheriæ*.

TUBERCULOSIS.

Dispensary Treatment: the Ideal and the Real.

IN a report published as an appendix to the L.C.C. Report of the C.M.O. and S.M.O. for the year 1919 (P. S. King and Son, Ltd., price 5*s*.) there is an illuminating and admirably candid review of the work, and in some cases of the want of good work, at various tuberculosis dispensaries in London. The disclosures made certainly warrant revision of the conduct of a system on which the whole tuberculosis campaign hinges. One of the most valuable functions of the dispensary medical officer is visiting the patient in his home. Yet it appears that the tuberculosis officer attached to St. Thomas's Hospital is not allowed by the rules of the hospital to consult at the homes of patients. On this point the report is emphatic. "This is an unfortunate restriction, and it is desirable in the interests of efficiency that the rule should be revised." A fault of certain tuberculosis officers appears to be a lack of intensive study of the individual case. Cases in which the diagnosis is doubtful are kept dancing in attendance for perhaps a year; more and more are added to their number, till the machinery of the dispensary becomes clogged and there is no time for the physical examination of even a tithe of the patients. As the report puts it: "..... the observation cases cease to be observed, and the only thing that is done for them is that their medicine is repeated." The number of attendances made at these peccant dispensaries is accounted for mainly by the large number of children who receive treatment without diagnosis.

A far more efficient system was found to be adopted in other dispensaries, where great pains were taken to study each case intensively for a short period and to arrive quickly at a diagnosis. As for the actual treatment given at the various dispensaries, some seem to be perpetuating the pernicious "bottle-of-medicine" system. In one dispensary the drug bill amounted to more than £900, and the extent to which "drugging" still exists is illustrated by a hospital dispensary where 4569 prescriptions were dispensed for a total attendance of 4853. The medicine included 1785 bottles of cod-liver oil, alone or combined. In another case large quantities of virol were used. As the report points out, this wholesale "drugging" tends to make the patient rely more on the medicine and less on such essential matters as hygiene and diet. With regard to treatment by the general practitioner, the attitude of the tuberculosis dispensary officer seems to have undergone a marked change. Formerly he wished to treat every tuberculous patient himself. At present many such officers realise that it is essential to maximum efficiency that the general practitioner should not be excluded from the treatment of this disease. It also appears to be admitted that the treatment of the individual case by the tuberculosis officer does not yield materially better results than when treatment is left to the general practitioner. Many other aspects of the dispensary problem are discussed in this report, which does not mince matters, and which, instead of attempting to whitewash the backslidings of badly run dispensaries, goes so far as to name the worst managed districts and to indicate clearly the lines along which reforms should be made.

Insurance against Pulmonary Tuberculosis.

The Insurance Committee for Newcastle-on-Tyne has issued a survey of sanatorium benefit in the period July, 1912–December, 1919. The Committee's medical adviser, Dr. W. H. Dickinson, observes that in the majority of cases patients were not notified and relief was not sought till the disease was advanced. Thus, in 1918, 50 per cent. of the persons certified as dying of pulmonary tuberculosis had not been notified before death or had died within three months of notification. It was also ascertained that the average duration of illness before notification was 15 months. Dr. Dickinson makes some very pertinent suggestions in this connexion. In his opinion there should be some form of insurance against pulmonary tuberculosis, subsidies to consumptives being more urgently needed than pensions for persons over 65. As matters now stand, the expectation of life for pensioners of this age among the working classes is very much longer than for patients in whose sputum tubercle bacilli have been found. During the period under review only 66 per cent. of the insured persons known to have died from pulmonary tuberculosis in Newcastle applied to the Committee for treatment, and Dr. Dickinson is convinced that, were something more attractive than the ordinary "sickness benefit" available for these patients, an important step would have been taken towards securing the earlier diagnosis so essential to the patient and his family. Dr. Dickinson adds: "Obviously the consumptive who had been treated for months on end for 'bronchitis' would be far from satisfied when he learnt that he had been entitled to extra allowances, and had not received them. This dissatisfaction would soon bear fruit." With regard to the establishment of industrial colonies, as recommended by the Inter-Departmental Committee, Dr. Dickinson calculates that there are, roughly, 1200 cases of pulmonary tuberculosis living in Newcastle. Allowing for four contacts for each case, Newcastle alone would provide between 5000 and 6000 occupants for an industrial colony. Also, as about 200 new cases would for some years be arising annually, with 800 new contacts, the sum to be expended on the colony would be enormous.

Suggested Application of the Public Health Acts.

In the report of the Medical Adviser to the Belfast Insurance Committee for the year ending Dec. 31st, 1919, Dr. A. Trimble emphasises the relation to the incidence of tuberculosis of "real" wages, that is to say, the relation between wage and cost of living, as distinct from mere wage irrespective of the purchasing value of that wage. In a table showing the results of treatment it appears that 124 out of 1840 patients were cured or their disease became quiescent. In 738 cases there was a family history of tuberculosis, 113 patients having a father and 160 having a mother who had suffered from tuberculosis. The death-rate from pulmonary tuberculosis shows a fall from 2·7 per 1000 in 1918 to 2·1 in 1919. While the tuberculosis officer for Newcastle-on-Tyne advocates pensions for the tuberculous as a means towards stamping out the disease, the medical adviser to the Belfast committee advocates more drastic remedies. He writes: "What is urgently required is that not only should tuberculosis be placed on the list of infectious diseases, but the patient should be subject to all the provisions

of the Public Health Act, so that where a patient 'is without proper lodging or nursing accommodation,' and where the local authority is willing to provide for his institutional treatment, he should not be allowed to remain at home, a source of injury to himself and a menace to the health of those with whom he lives."

THE LEAGUE OF RED CROSS SOCIETIES: THE MEDICAL ADVISORY BOARD.

THE first meeting of the Medical Advisory Board of the League of Red Cross Societies was held at Geneva, at the headquarters of the League from July 5th to July 8th under the honorary presidency of Professor Emile Roux, director of the Pasteur Institute at Paris. Dr. Simon Flexner, director of the Rockefeller Medical Research Institute, served as chairman, and Colonel S. Lyle Cummins and Professor Giuseppe Bastianelli acted as secretaries.

The majority of the recommendations submitted to the Board by the Medical Section of the General Council of the League in March were approved. Those which will not be put into effect at this time were concerned chiefly with the establishment of laboratories and a museum, it having been decided that for the time being it would be wiser for the League to utilise existing facilities.

A Policy of Coöperation.

In general, the Medical Advisory Board outlined for the League a policy of coöperation with national Red Cross Societies and other health agencies, and of acting as a clearing-house for medical information. The latter function will continue to be accomplished through the League's publications and through the free medical information service of the Department of Medical Information. The publications include the *International Journal of Public Health*, a scientific organ; the *Bulletin of the League of Red Cross Societies*, a popular monthly, both published in four languages; and pamphlets of various kinds.

The support of national Red Cross Societies for the campaign against typhus and other communicable diseases in Poland was asked, and the coöperation of the League of Nations was requested.

The immediate organisation of a child welfare unit, and its despatch to some country which would engage gradually to take over its work and to duplicate its activities, was sanctioned. The work of this unit is to include the training of doctors and nurses, as well as the education of the public in child welfare. The Medical Advisory Board also suggested that the League of Red Cross Societies participate in creating or assisting in creating schools of puericulture or child welfare centres, and in providing scholarships for doctors and nurses in existing schools. A limited investigation into the causation of rickets in Vienna was recommended, if it seemed feasible.

Venereal Disease; Tuberculosis; Malaria.

Education in sex hygiene and antivenereal propaganda are to be continued by the Social Hygiene Department of the League, which also is to study the means by which it would be possible to reduce the cost of salvarsan; to promote regional conferences dealing with venereal disease; and to take measures to diffuse moral and physiological knowledge.

The antituberculosis measures to be undertaken by the League include the creation, in certain districts of several countries of Europe, of antituberculosis demonstrations. Each would carry out a preliminary survey of latent tuberculosis and open infection in the entire population of its chosen district according to age, sex, profession, and social groups; a statistical study of tuberculosis mortality and of the types and forms of the localisation of the disease; the establishment of an adequate number of dispensaries, run by specially trained physicians and visiting nurses; the organisation of open-air schools for children; and the education of the medical profession, as well as of the public, regarding the social fight against tuberculosis.

The proposed antimalaria programme of the League of Red Cross Societies in Spain was approved by the Medical Advisory Board, which also believed it suitable that the League study means of reducing the cost of quinine.

Sanitary Surveys.

The work outlined for the League's Department of Sanitation comprises the making of sanitary surveys, such as have already been carried out to a certain extent in Roumania and Slovakia; the promotion of public knowledge upon housing, pure water-supplies, and kindred sanitary subjects; a demonstration of the efficiency of chlorination in water purification; and the establishment of liaison officers in sanitation with the national Red Cross Societies.

National Red Cross Societies were advised to create, where possible, medical bureaux to maintain communication with the League of Red Cross Societies with regard to health. Adequate and full registration of vital statistics, international standardisation of forms and methods, and the stimulation of interest in statistical methods among physicians and the general public were urged. It was pointed out in this connexion that the major part of the collection and publication of statistics must remain under Government auspices, but that until international coöperation is fully established in this field the League of Red Cross Societies can do much effective work.

The Medical Advisory Board gave its approval of the work already carried out by the League of Red Cross Societies, and passed an especial resolution to this effect.

The different nations were represented on the Board as follows: Belgium, Dr. J. Bordet; Denmark, Dr. T. S. Madsen; France, Professor Emile Roux, Dr. Albert Calmette, Dr. Leon Bernard; Great Britain, Colonel S. Lyle Cummins, Sir Walter Fletcher, Sir George Newman; Italy, Professor Giuseppe Bastianelli, Professor Aldo Castellani; Japan, Professor Takasugi; United States, Dr. Simon Flexner.

Dr. William H. Welch and Dr. Hermann M. Biggs, of the American delegation, were unable to attend the conference, as was Dr. Carlos Chagas, of Brazil, the South American member of the Board. Professor Takasugi, while not a member of the Board, attended its sessions as a substitute for Professor Kinnosuke Miura, the Japanese representative.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The Nationalisation of Drug Stores and Apothecary Shops.

THE Austrian Board of Health has laid before the National Assembly (our present House of Parliament) a Bill for nationalising all the existing apothecary shops and drug stores as well as pharmaceutical factories. The leading idea is that all such commercial enterprises should become property of the State, although they need not be run by the State. The present owner may rent, or duly qualified government officials may conduct the business. All the existing State apothecary stores —in public or military hospitals—will be opened for public use. No new licence will be issued to private individuals; the old ones will be gradually cancelled. If an apothecary intends to dispose of his store he must offer it first to the State, and only if his offer is refused may he put it up for sale to private persons. The 20-fold average profit of the last seven years is the basis of the transaction. Besides this sum, the quantity of drugs, the stock, and outfit must be paid for by the State. If the possessor dies the same procedure holds good for the benefit of his family or heirs. The establishment of new drug stores in a certain place can be demanded by the municipality or the legal representatives of the medical profession, the apothecaries, or the "sick clubs" (Krankenkassen), and can be effected only by the State. The rentability of the existing drug stores in the neighbourhood must not be endangered by the new licence.

Every doctor of medicine in active practice is entitled to dispense such remedies as are required for urgent or immediate use or application, but he must buy them in a public drug store. Naturally this Bill, the leading lines of which have just now been sketched, meets serious resistance from the owners of dispensaries and pharmaceutical shops. Their chief argument is that by this Bill prices will be raised, although the chief reason for its introduction was the universal feeling of the population that they were overcharged by the dispensaries. On the other hand, all the persons who have taken up the study of pharmacy with a legitimate prospect of obtaining in due time a licence, and thus find a comfortable living, are naturally disappointed. Nevertheless, it is likely that the objections will be overcome and that the public will derive benefit from this procedure. The State will also gain by the new system.

Definite Settlement of Relations between Dental Surgeons and Dentists.

The present regulations pertaining to the work of technical dentists and dental surgeons were of such an unsatisfactory nature that they were a source of frequent annoyance and dispute between the patients, the profession, and the dentists of both kinds. Whilst the dental surgeons—they must be fully qualified medical men, with a normal medical training and graduation in this country—claim that they are entitled to do all kinds of work necessary for the treatment or repair of the teeth and the insertion of plates or artificial teeth in the mouth of a patient, the technical dentists demand that the doctors should limit their work to the purely medical or surgical part of treatment (filling of teeth, extraction, treatment of diseased roots). All the rest, including the manufacturing of artificial plates and teeth, the adaptation of such, the insertion of teeth into existing sockets, as well as all preparatory work necessary in that process, should be their own domain. But as such strict limitations are scarcely possible in actual practice—both kinds of work must needs overlap—there was always trouble. The technicians form a special guild, a corporation, of which doctors could not become members, and this corporation not only wanted to exclude doctors from all technical dental work, but demanded for themselves the right to perform in the mouth of patients all work necessary to make their apparatus fit and good for use. At last Government has worked out, with the coöperation of doctors and technical dentists, a Bill which will do away with all differences of opinion. The chief point is, that the existence of an independent corporation of technical dentists will cease. In future, the technician will be only a "hand" in the office of the dental surgeon. But the technicians now practising will be permitted to do certain minor pseudo-surgical work in the mouth with the exclusion of all bloody operations (especially the extraction of teeth may not be performed by them). No new licence will be granted to a technical dentist, and all these men practising at present will be controlled by the Board of Health. Only doctors of medicine will in future be permitted to treat diseased teeth and will be entitled to employ qualified technical dentists; these latter will be regarded as sanitary assistants. These men, and persons desiring to learn technical dentistry, will be able to do so in special schools attached to dental departments of public hospitals, or they will be able to "apprentice" with a duly qualified dental surgeon. By these means the technicians who until to-day have been in bona-fide practice will be able to continue their practice, whilst in about 20–30 years only doctors will treat diseases of teeth and mouth.

Post-graduate Lectures during the Summer Months.

A series of post-graduate lectures will be delivered during the months of August and September by a number of clinical assistants and privat-docents of the University of Vienna, the course including 6 to 24 lectures, open to graduates of all countries. Also special courses and classes will be arranged, lasting seven weeks respectively. The whole range of medical and surgical knowledge comes into review. Laryngology, otology, dermatology-syphilis, ophthalmology, pediatrics, and pathology will be chiefly dealt with. It may interest English readers to learn that American doctors are already coming to Vienna. At present several are working here in the clinics, and for the winter term, commencing in October, a considerable number have already booked places. Order and regular running of the hospitals and clinics has been ensured by this time, so that visitors may expect to find their time well spent.

Marked Decrease of Population Owing to the War.

The report of the census of the population taken on Dec. 31st, 1919, has recently been published and shows clearly the deleterious effects of the war. Austria has been cut down to a population of 6,182,450, whilst in the same area there lived before the outbreak of the war (1913) 6,575,000 persons. If the average increase had not been interfered with the population would have been about 6,872,000. The actual drop is about 700,000, due in some part to a very marked emigration. Many persons preferred to go to the new formed national states, partly for family reasons, partly from a business standpoint. The centres of depopulation are the large cities and towns. Vienna counts only 1,880,000 inhabitants, or 200,000 less than in 1913; the rural districts are not much worse off than before the war. But still even there the decrease is noticeable. A marked change has taken place in the relative numbers of the sexes. The actual war loss of male lives in the Austrian area amounts to a little more than 180,000, apart from the deaths due to malnutrition. The percentage of men and women bears at present the relationship 47 to 53, against 49·5 to 50·5 in pre-war time. The number of children is by 20 per cent. less than before; the birth proportion of sexes is now 109 girls to 100 boys. A sad outlook for the regeneration of the race!

Vienna, July 26th.

CERTIFICATION OF INSURED PERSONS IN IRELAND.

THE Irish Insurance Commission has issued an important letter to each medical certifier in Ireland. In the first place the announcement is made that the Treasury has agreed to raise the remuneration for certification by 40 per cent. This increase is given as the result of a demand made on behalf of the profession by the Irish Medical Committee, which refused as inadequate a previous offer of a 25 per cent. rise. The increase now given is roughly proportional to that recently granted to panel doctors in Great Britain, and inadequate as it is when the rise of prices is considered the Irish Medical Committee had no choice but to accept it. The increased remuneration is to date from Jan. 1st, 1920.

The Commission in its letter goes on to state that certain other matters in regard to certification came up for discussion between the Commission and the representatives of the Irish Medical Committee. The Commission complains of certain irregularities in certification at the hands of certain certifiers, and also with some emphasis of the laxness of local medical committees in investigating the complaints submitted to them. It appears that some certifiers have been in the habit of issuing certificates in mass, either retrospectively or prospectively, and the Commission points out how such an irregularity should be avoided. More serious attention is drawn to the issue of certificates without previous medical examination, an act which, even if no fraud be committed, is without excuse. Certain minor duties in regard to the notification of tuberculosis and other matters undertaken by certifiers appear to have been largely neglected.

It is understood that a new and more definite procedure in regard to the investigation of complaints has been agreed on. Much of the delay in the past has been due to the difficulty of assembling the Local Medical Committee in country areas. In future the duty of investigating complaints is to be delegated to a "complaints subcommittee" of three or five members, being in convenient proximity to a suitable meeting place. All the relevant facts, as far as known to the Commission, are to be submitted to the members of the committee in advance of their meeting. Both the accused certifier and a representative of the Approved Society bringing the charge is to have the right of being present at the meeting of the subcommittee, though the members come to their decision in private. Our Dublin correspondent, to whom we are indebted for these particulars, regards the procedure now outlined as fair and reasonable, and expresses a hope that the Local Medical Committees will take this part of their task seriously. It should, he adds, be remembered that the reference of complaints to the local committee is designed to protect the interests of medical men.

Correspondence.

"Audi alteram partem."

HELMINTHIC INFECTIONS AND PELLAGRA.

To the Editor of THE LANCET.

SIR,—May I be allowed a few words of comment upon the last paragraph of Lieutenant-Colonel P. S. Lelean's letter published in your issue of July 17th? Colonel Lelean writes that if the deficiency factor is only a contributory factor to a determining cause yet to find, the suggestion that the latter is to be sought in a helminthic infection (such as with *Ascaris*) is equally difficult of acceptance. Now, so far as regards the suggestion made recently by myself in this connexion, I have not considered the helminthic infection as the determining cause and the deficiency factor as only a contributory one. The matter is rather the other way round.

As will be clear, I think, to readers, both of my section of the Pellagra Report on the Turkish Prisoners of War, and of my letter published in your issue of May 28th, the question is whether a helminthic infection is to be regarded as an essential contributory factor, perhaps especially important as a predisposing cause; a dietetic deficiency being considered (in most cases, at all events) as the actual determining cause. As I wrote:—

"There is, of course, no intention of suggesting here that helminthic infections, by themselves alone, constitute the specific cause of pellagra; ..... such infections are known to be prevalent in many districts and countries where pellagra never, or only rarely, occurs."

May I illustrate by a rough analogy? Chronic, local irritation or stimulation is known to be often a most important contributory or predisposing cause of malignant disease; but this alone is not regarded as the immediate determining cause of malignancy, because a malignant growth does not necessarily supervene upon such a condition.

In the case of pellagra what I had in mind was that, as regards the extent of their responsibility, the two factors might perhaps stand in relation to one another in this way. The greater the adverse effect of helminthic intoxication (and this may not be the same thing as the heavier the infection itself), the less would be the degree of dietetic deficiency which would suffice to produce suprarenal inadequacy and pellagra, and vice versa. With reference to the Turkish prisoners, I stated in the summary of my report that the occurrence of *Ascaris* eggs was very general, not only amongst the pellagrins but equally amongst those who were liable at any time to become pellagrous. Just at the time I was at Kantara, the incidence of pellagra was becoming very high; and had not the labour been knocked off, one would hesitate to say how many of the "apparently healthy" Turks would not have gone on to show a manifestly pellagrous condition. I do not think, therefore, that my suggestion is so difficult of acceptance.

Is it known whether any of the prisoners of our M.E.F. and E.E.F. in Turkish hands showed symptoms of pellagra? And, if so, whether the cases occurred among the British or the Indians, or both? Because certainly the Indians would be more generally infected with helminths than the British. At any rate, as a first step I think it would be worth while for workers in pellagrous areas to endeavour to ascertain whether there is a distinct correlation between cases of pellagra and the occurrence of helminthic infections.

I am, Sir, yours faithfully,

July 31st, 1920. H. M. WOODCOCK.

THE TUBED PEDICLE IN PLASTIC SURGERY.

To the Editor of THE LANCET.

SIR,—The operating books, surgical records, and ward sisters' report books of the Queen's Hospital show the following statement of fact. The first occasion on which the pedicles of a face flap were definitely tubed occurred at the first operation I performed on A.B. V., the burnt seaman, the operation taking place on Oct. 3rd, 1917. These tubed pedicles progressed so well that the second stage operation, division of pedicle towards its base for use on the face, was performed on Oct. 17th, 1917 (Mr. H. C. Mallison for me). Captain J. L. Aymard's case, B. C. H., was operated on Oct. 18th, 1917, when he designed an original flap for making the nose and at the same time "tubed" it, in the same way as was my case. I am to blame in not informing Captain Aymard at the time he published his rhinoplasty case in your paper that he was not the first to get on to the principle of "tubing" the pedicle.

I am, Sir, yours faithfully,

H. D. GILLIES.

Queen's Hospital, Sidcup, August 3rd, 1920.

THE CLINICAL DIAGNOSIS OF DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—I have followed with great interest the recent correspondence on the above subject. Being able to lay claim to considerable practical experience of both sides of the problem—the clinical and the bacteriological—I make bold to set forth some views on the subject. If it were always remembered that there can be no such thing as infallibility, clinical or bacteriological, there would be no occasion for "exclusive advocacy" by the holders of opposing views. In this matter of diphtheria diagnosis there is no time for opposition and argument. There is urgent need for coöperation and agreement. The clinical manifestations of diphtheria cannot be systematised with absolute certainty. However sure each of us may have been of his ability to dogmatise upon faucial lesions, sooner or later admission had to be made of a mistaken diagnosis. I think such must represent the experience of all fever workers. How could it be otherwise? So equally must bacteriological dogmatism be impossible where diphtheroid organisms are in question. Many times the clinician must be disagreeably surprised by the variety of bacteriologists' opinions where *B. diphtheriæ*, *B. hofmann*, and diphtheroids are under judgment.

Some such considerations may have been in Osler's[1] mind when he remarked that—

"The clinical and bacteriological conceptions of diphtheria are at present not in full accord. On the one hand, there are cases of simple sore-throat which the bacteriologists, finding the Klebs-Löffler bacillus, call true diphtheria. On the other hand, cases of membranous, sloughing angina, diagnosed by the physician as diphtheroid, are called by the bacteriologists pseudo-diphtheria or diphtheroid angina. The term diphtheroid may be used for the present to designate those forms in which the Klebs-Löffler bacillus is not present. Though usually milder, severe constitutional disturbance and even paralysis may follow these so-called pseudo-diphtheritic processes."

Surely the foregoing is a laboured attempt to make distinction where there is no difference. It frequently happens that a patient suffering from local and general symptoms and having all the clinical characters of diphtheria, cultures "negative" for as many days as are required to rid the throat of the false membrane. Is it to be wondered that "clinical and bacteriological conceptions of diphtheria are not in full accord"? The explanation of the apparent inconsistency is simple. A consideration of the histological structure of the false membrane will demonstrate the mechanical impossibility in given cases of a swab, lightly rubbed upon the surface, reaching the underlying diphtheria bacilli. The parts touched are swarming with pyogenic cocci, which, on culture by the bacteriologist, must give a "negative field." The cold scientific fact is that the particular swab submitted for examination is "negative." The cool conclusion that the patient involved has no diphtheria organisms in or about the fauces, hence cannot be suffering from diphtheria, is unscientific, and only serves to create a situation of professional embarrassment.

Scientific procedures cannot altogether supersede clinical observations. They must serve as valuable aids, and, if accorded that function, but not relied on

[1] The Principles and Practice of Medicine, pp. 192-193.

and acted upon slavishly, there will be no need to state such an apparent contradiction in terms as that—"though usually milder, severe constitutional disturbance, and even paralysis, may follow these so-called pseudo-diphtheritic processes." With the realisation that there need be no incompatibility between the bacteriologist's "negative" finding in an isolated throat swab and the practically undeniable presence of a clinical diphtheria, scientific judgment need no longer be questioned nor clinical prescience discredited.

To sum up, it may be said that some cases of diphtheria, probably the most severe, can only be diagnosed clinically, whilst others, certainly the mildest, can alone be proved by the bacteriologist. Apart from these extremes, the vast majority can be correctly and expeditiously diagnosed by correlating the clinical appearances with the bacteriological findings.

I am, Sir, yours faithfully,

JAMES LAW BROWNLIE.

Glasgow Corporation Laboratory, July 29th, 1920.

VENEREAL PREVENTION.

To the Editor of THE LANCET.

SIR,—With reference to the report published in THE LANCET of July 10th of the speech by the Minister of Health to the deputation received by him on July 2nd from the Society for the Prevention of Venereal Disease, we ask you to insert the following remarks.

Dr. Addison's reply was far short of convincing the deputation. He expressed his strong opinion that the Society's proposal would stir up intense and vehement opposition, and urged further his view that there was no basis of ascertained fact on which it was quite safe to dogmatise. The Society, on the other hand, holds that there is abundant evidence available regarding the successful use of medical prevention, on which positive teaching can be securely and justifiably based. It thinks, further, that the Minister's fear of agitation was exaggerated, and that public opinion is setting in the direction of the views it is advocating.

But a more important point for comment is the error made by the Minister when, in elaborating his main argument against applying the Society's preventive procedure to the civil population, he said that "they could not deal with a population of 40 millions on the same basis as Sir Archdall Reid, with iron discipline at his command, could deal with 2000 soldiers at one time." The information about Dr. Reid's experiences supplied to Dr. Addison was seriously wrong. These experiences were spread over nearly three years, among a fluctuating population of soldiers in barracks amounting to about 40,000 in all. He lectured to all the men arriving at barracks, in smaller or larger groups, sometimes even to one man at a time. Then he informed them that those who chose to run risks and wished to protect themselves could obtain the necessary disinfectants by application to the orderly, and he told the men how to use them. There was no "iron discipline"; in fact, no discipline at all. The men were warned and instructed in the same way that the Society thinks applicable to the civil population. There is certainly no necessity for either soldiers, sailors, or ordinary civilians to be "scientific" in order to carry out clear instructions based on scientific knowledge.

Lastly, we would note that the findings of the Inter-Departmental Committee, which Dr. Addison referred to as "a strong body of men whose advice he asked," have been already definitely challenged more than once, and that that Committee's report has been deemed by many competent critics to bear the mark of an insufficient inquiry and a foregone conclusion.

We are, Sir, yours faithfully,

H. BRYAN DONKIN,
JAMES CRICHTON-BROWNE,
W. ARBUTHNOT LANE,
G. ARCHDALL REID.

London, August 4th, 1920

DRUGS AND THEIR ACTIVE PRINCIPLES.

To the Editor of THE LANCET.

SIR,—The leading article in THE LANCET of July 24th dealing with the subject of galenicals *versus* active chemically separated constituents, raises a most important pharmacological point—the pharmacology of the parent substance in many cases cannot be entirely identical with that of the isolated principle. To give a homely illustration, can it be admitted for a moment that a few grains of caffeine in hot water represent the same thing as a cup of tea?

When, as was shown in a series of researches published some years ago from your Laboratory that in a tea infusion the alkaloid was in definite combination with tannin as a compound breaking up slowly in the organism, it seemed to me clear that tea must be a different thing pharmacologically from caffeine or its salts. The question appears to me to hang on the colloidal state. Galenicals all through are colloids, slowly diffusible; active constituents are crystalloids, rapidly diffusible. Examples of both are obvious. Morphia and its salts surely cannot be put precisely on the same pharmacological basis as opium.

I am, Sir, yours faithfully,

August 3rd, 1920. GALEN.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, JULY 27TH.

Health Resorts and Watering-places Bill.

Lord SOUTHWARK moved the second reading of the Health Resorts and Watering-places Bill, which had passed the Commons. The Bill proposed to enable local authorities to levy a 1*d*. rate for advertising health resorts and watering-places. This power was given to Irish local authorities in 1909.—Lord ASKWITH moved the rejection of the Bill on the ground that it was unnecessary and uneconomical.—After some discussion, in which several noble lords opposed the Bill, Viscount ASTOR (Parliamentary Secretary to the Ministry of Health) said that the Government did not officially adopt the measure, but in the Commons left it to the free vote of the House, and they proposed to follow the same course in their lordships' House.—On a division the Bill was rejected by 38 votes to 12.

THURSDAY, JULY 29TH.

Proprietary Medicines Bill.

Viscount ASTOR, in moving the second reading of the Proprietary Medicines Bill, said that it was introduced in fulfilment of an undertaking given by the Lord Chancellor on behalf of the Government last year. It had been framed on the recommendations of the Select Committee which reported in 1914. The Committee's recommendations were in the nature of a compromise, and were not based on either of the two conflicting views. This country was very much behind several of our dominions, as well as most other civilised countries, in its treatment of proprietary and patent medicines and surgical appliances. As an example of the way in which our public were victimised the Select Committee quoted the instance of a man who came with a certain instrument to this country and was reported to have made over £60,000 by its sale. He went to France and was sentenced to three years' imprisonment, as well as heavily fined, for trying to sell the same instrument. Additional legislation was certainly necessary here to deal with the matter. At the present moment there was no Minister or Government department which was responsible for protecting the public, or for seeing that the public did not suffer grievous injury. The Bill did not propose to protect the purse of the public, though possibly amendments might be moved later to strengthen the Bill in that respect. Injury might be caused in one or two ways. Sufferers who purchased and attempted to use these appliances and medicines very often postponed going to a proper medical practitioner while trying to treat themselves. The delay very often aggravated their ailment, sometimes very seriously. In other cases actual injury was caused through these remedies. They proposed to prohibit the advertisement and sale of remedies purporting to treat, cure, alleviate, or prevent diseases which were set out in the schedule—cancer, consumption, diabetes, certain diseases peculiar to women, fits, epilepsy, deafness—because they knew that serious risk was involved if sufferers tried to treat themselves by using a patent drug. These were serious complaints, and it was not in the public interest that people, haunted by fear, should

be encouraged to use these remedies. Too often they merely touched a symptom of the disease. A case was quoted in the report where a particular medical wine was advertised, and it was stated that if two wine glasses full were taken that was a sufficient amount to cause sleep. It was recommended for children in these words, "For colds, coughs and bronchial affections." It contained cocaine, or the elements of cocaine, and nobody would advocate the continuation of a law which allowed or encouraged people to purchase cocaine in order to make their children sleep when they were suffering from a cough. It was essential that they should take powers to deal with these evils. In a limited number of cases death was caused, particularly where remedies were used intended to produce abortion. A considerable number of remedies were advertised as being suitable for female irregularities. He was told that at the best these remedies were useless, and that too often the most serious consequences resulted from their use. It was impossible, he was told, to kill an unborn child without endangering the life of the mother. Some of these remedies were intended to give lead poisoning. It was quite true that you might kill the unborn child by this means, but too often they also killed the mother. These remedies also led to blackmail. A case was quoted of two men who had threatened to expose the purchasers of a particular remedy intended to cause abortion. The police intercepted 600 letters containing two guineas each from these unfortunate women, who were paying this money under a threat of exposure. If the Bill did nothing else but prevent this reprehensible practice they would be justified in trying to pass it. The Assistant Director of Public Prosecutions said it was almost impossible to prove fraud, and that practically the law was non-existent. They could not expect the purchaser of a remedy intended to produce miscarriage to come forward after having bought the remedy and say: "I bought this remedy in order that I should be able to commit a crime. I have not been able to produce miscarriage. I have been defrauded." He knew a case where a bottle of mixture was sent with the intimation that the powerful and certain action of the medicine contained in the bottle necessitated the warning that the contents should not be taken by those expecting to be mothers, as the medicine was very liable to cause a miscarriage. That was the way in which these drugs were brought to the notice of a large number of unfortunate women who too often in the past had availed themselves of them. He would quote a brief paragraph from the Report of the Select Committee which summarised, very briefly, the situation. The Committee stated:

"For all practical purposes British law is powerless to prevent any person from procuring any drug, or making any mixture, whether potent or without any therapeutical activity whatever (so long as it does not contain a scheduled poison), advertising it in any decent terms as a cure for any disease or ailment, recommending it by bogus testimonials and the invented opinions and facsimile signatures of fictitious physicians, and selling it under any name he chooses on the payment of a small stamp duty, for any price he can persuade a credulous public to pay."

The Bill proposed that a register should be made on which every proprietary medicine and surgical appliance and the owners thereof should be registered. The sale of unregistered remedies was prohibited. Powers were taken, subject to the right of appeal, to remove the owner of a proprietary medicine from the register if his remedy was considered too dangerous to health. Powers were also taken to compel the owner to disclose the contents, the formula, the ingredients to the Government privately and in confidence. Heavy penalties would be imposed for non-disclosure. Further, they prohibited the advertising of remedies purporting to prevent, cure, or relieve the diseases which were set out in the Schedule. Clause 5 stated that the alcoholic contents of a patent medicine must be given on the label. Many of the medicated wines contained as much alcohol as some of the heaviest wines and twice as much as claret. A particular medicine referred to by the Committee which was recommended for use at the time of confinement was found on analysis to contain something like 60 per cent. of alcohol and the rest was apparently pure water. This was recommended as assisting confinement and producing fine and healthy babies. The Bill prohibited correspondence with the vendors, and the enclosure of literature with one remedy recommending the use of another remedy. They also prohibited the advertising of remedies suggesting that they were useful or could be used for procuring abortion. Clause 5 set out that all regulations must be laid before Parliament. The Minister of Health was made responsible for the supervision of the matters dealt with. In Clause 10 there was a definition of a "proprietary medicine." They excluded from the definition those proprietary medicines which were not advertised, pushed, or puffed in writing as being remedies, or having special therapeutic qualities. They proposed to exclude mixtures the composition of which was known, which were made by well-known and reputable chemists, and which were not pushed for sale on the ground that they had special therapeutic qualities. Nor did the definition include any recognised drug or preparation for which no monopoly was claimed. He knew that the press derived a large revenue from the advertising of patent medicines and surgical appliances, but he had too high an opinion of the press as a whole to believe that they would attempt to stop the passage of the Bill.

Lord ASKWITH said that the noble Viscount had not quite brought before their lordships the importance of this industry as a whole, which might be judged from the fact that last year more than £1,250,000 was paid in stamp duty to the Inland Revenue. He understood that there were about 10,000 retail pharmacists in the kingdom, apart from the bigger shops, with an enormous number of formulæ for making these proprietary medicines. The industry employed a very large number of people and produced a lot of articles, many of which were extremely useful to the community at large; and though everyone deprecated the remedies mentioned by the noble Viscount, yet there were other remedies which almost every man, woman, and child in the country used on and off in the course of the year. He was sure that there could not be anyone in their lordships' House who had not at times derived great advantage from taking a proprietary pill. He agreed that regulation was necessary, but a good opportunity should be afforded to those concerned to see that the Bill did not affect them unfairly.—Earl RUSSELL said if it was their object to see that the public were not defrauded the best thing was to state in the plainest language on the wrapper the contents of the medicine, and he would put down an amendment to that effect for the Committee stage. He thought that instead of the registered ingredients being kept secret they should be furnished to Parliament in a White Paper, so that they might be available to the press, or anyone who wished to see them. He doubted whether there was any such thing as a real secret in the composition of these medicines which was not known to the Pharmacopœia. He thought that it would be just as well if venereal diseases were included in the Schedule of the Bill.—Lord EMMOTT said he fancied that this Bill would probably need another very considerable bureaucracy. On the face of it it seemed to him rather un-English to demand a full disclosure of ingredients unless a very strong case could be made out for doing so. He hoped that the Bill would not be pushed in this period of the Session.—Viscount KNUTSFORD, while hoping that there would be no delay in passing the Bill, said he thought a man who invented a machine to help one to hear, or a good truss, ought to be allowed to advertise it.—After further discussion Viscount ASTOR replied briefly to the points raised, and the Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, JULY 28TH.

Medical Attendance for Soldiers on Demobilisation Furlough.

Captain COOTE asked the Secretary for War whether he was aware that if soldiers on demobilisation furlough fell so seriously ill that they were unable to move they were unable to report at the nearest military hospital, and therefore had to bear the whole of the expense of medical attendance until such time as they could be moved into hospital; whether he was aware that such men were not upon any panel and could not therefore secure free medical attendance from civilian practitioners; and whether in such cases he could cause a refund to be paid on account of medical expenses incurred.—Sir A. WILLIAMSON (Financial Secretary to the War Office) replied: Soldiers on demobilisation furlough are entitled to free military treatment from a military source. If the seriousness of the soldier's condition makes it impossible for him to report personally it would generally be practicable for a relative or friend to send the necessary intimation to the military authorities. If this were done the cost of private treatment incurred up to the time of removal to a military hospital would be refunded. If the soldier were too ill even to arrange for his illness to be reported, and his relatives were unaware of the correct procedure, a refund of the medical expenses would not be refused on that account.

New Dental Legislation.

Mr. RAFFAN asked the Minister of Health whether he could now state when it was proposed to introduce legislation for the purpose of carrying out the recommendations of the Departmental Committee on the Dentists Act, 1978.—Dr. ADDISON replied: The Bill will be introduced before the recess.—Mr. RAFFAN: Is the right honourable gentleman aware that the introduction of legislation on this subject was promised before the Whitsuntide recess, and can he say definitely if it will be introduced before the recess?—Dr. ADDISON: I expect it will.

Destruction by Rats.

Mr. GRUNDY asked the Parliamentary Secretary to the Ministry of Agriculture whether he was aware that rats were now consuming not only the actual sum of the bread

subsidy, which amounted to £45,000,000, but at the present price of grain nearly twice that amount; and whether he could state what action his department was taking to rid the country of these rodents.—Sir A. BOSCAWEN replied: I am aware that the depredations of rats are responsible for the loss of very considerable quantities of food, including grain. Any estimate of damage must necessarily be problematical, and I cannot vouch for the figure mentioned by the honourable Member. Since my department assumed responsibility for supervising the measures for the destruction of rats every effort has been made to instruct local authorities as to their duties under the Rats and Mice (Destruction) Act, and by personal instruction of their officers and the issue of pamphlets and notices to the press to call attention to the waste of food and damage to property caused by rats. As a result there has been a considerable reduction in the number of rats in certain parts of the country where effective measures have been taken, and it is to be hoped that such counties which have not as yet taken steps to organise schemes of rat destruction will shortly do so in view of the undoubted benefit and saving to the community of such action.

Suggested Railway Concessions for Disabled Service Men.

Captain BOWYER asked the Minister of Transport whether he was aware that many disabled ex-soldiers in this country were put to discomfort, and in many cases suffering, through having to travel in overcrowded carriages where it was impossible for them adequately to protect artificial limbs and stiff joints, and other effects of serious wounds, from jars and blows inevitable in view of the overcrowded state of the carriages; whether he was aware that in Belgium a reduction of 75 per cent. on all fares was granted to ex-Service men; and whether he would consider the possibility of adopting similar measures in this country, the effect of which would be to enable seriously wounded men to travel by better-class and therefore less crowded carriages.—Mr. NEAL (Parliamentary Secretary to the Ministry of Transport) replied: I was not aware of the fact mentioned by my honourable and gallant friend. The cost of any concessions in railway travelling must ultimately fall on other users. I do not think the method suggested is the most suitable way of dealing with the class of case mentioned, but I shall be glad to discuss the whole question with the honourable Member.

Condemned Food.

Major BARNES asked the Food Controller if his attention had been drawn to statements that, owing to the vigilance of the local inspector of food, there was recently discovered 60 tons of meat unfit for human consumption released from the stocks belonging to the Government for the food of the population of Newcastle-on-Tyne; whether the total amount of such food so detected during the past 12 months approximated to 800 tons; and if he would see that meat of a quality fit for human food was sent to that city.—Sir W. MITCHELL-THOMSON (Parliamentary Secretary to the Ministry of Food) replied: I am unable to state the total amount of food condemned at Newcastle during the past 12 months, but the total quantity since the beginning of this year is 164 tons, which includes a considerable quantity of home-grown beef condemned for tuberculosis. In at least two cases (representing approximately 30 tons of imported meat) the meat had been sold elsewhere by the Ministry and had been despatched by the buyer from the place of sale to Newcastle. The remainder of the cases are being investigated. All meat which is released by the Ministry for sale comes under the jurisdiction and the inspection of local inspectors in the same way as if it were privately owned, and there is no ground for the suggestion that the agents of the Ministry have attempted to issue for human consumption meat which was unfit for that purpose.

Slaughter Houses and Public Health.

Mr. DONALD asked the Minister of Health if he would state whether Ireland was represented on the Committee to consider and report on the legislative and administrative measures necessary to secure adequate protection for the health of the people in connexion with the slaughtering of animals for food; and whether Ireland would be included in the Committee's Report.—Dr. ADDISON replied: The answer to the first part of the question is in the negative. The terms of the Committee's reference limit its consideration to the problem as it affects England and Wales.

THURSDAY, JULY 29TH.

Causes of Death of Service Pensioners.

Mr. TYSON-WILSON asked the Minister of Pensions if he could give, approximately, the cause of death of the officers and men who had died since pensions were granted them.—Mr. MACPHERSON replied: I regret that in view of the regrettably numerous cases involved the information desired could not be furnished except with a very great deal of research and labour, which I cannot ask my staff to undertake.

The Dissatisfaction with the Pensions Appeal Tribunal.

Mr. CHARLES EDWARDS asked the Minister of Pensions if he would consider the appointment of a Committee to amend the Appeal Tribunal with a view to giving the greatest possible satisfaction to discharged disabled men.—Mr. MACPHERSON: I have pointed out that the Ministry of Pensions have no power whatever over the Pensions Appeal Tribunal. It is a body appointed by the Lord Chancellor. It was enacted because the House was not satisfied that the Ministry of Pensions would bring to bear on any particular case a fair mind. The House, having insisted on this tribunal being appointed, I am astonished to find any honourable Member coming to any other conclusion than that the Pensions Appeal Tribunal, which is an outside body, is the best possible one to consider these cases.—Sir E. CARSON: Is not this rule as to whether a particular complaint was contracted or caused by service in the war one that ought to be very liberally construed, having regard to the difficulties of saying when a disease commenced?—Mr. MACPHERSON: I quite agree. It is the case, and it is most difficult. As a matter of fact, appeal to this Pensions Appeal Tribunal has been granted in 70 per cent. of the cases.

Captain COOTE asked the Minister of Pensions whether, if a man was refused pension in the first instance on the ground of non-attributability and was subsequently granted a pension by an appeal board upon a decision that his disability was attributable to war service, the man was entitled to arrears of pension at the rate granted by the appeal board as from the date of his first application for a pension or only as from the date of his appeal board.—Mr. MACPHERSON replied: My honourable and gallant friend is under some misapprehension as to the powers of the Pensions Appeal Tribunals, to which I presume he refers. These tribunals do not assess the rate of pension, but only decide the question of attributability or the contrary. Where the tribunal finds in favour of an appellant arrears of pension are granted at the rate appropriate to the degree of disablement found by my medical advisers to have existed from time to time for a period not exceeding one year prior to the date on which the appeal was made.—Captain COOTE: Is there any reason why a pension should not be granted from the date of the first application?—Mr. MACPHERSON: The only reason—and it is a very sound one—is that Parliament has decided otherwise.

Dentures for Ex-Service Men.

Mr. BRIANT asked the Minister of Pensions if he would state what arrangements were made for the supply of dentures to ex-Service men who required the same by reason of illness or injury sustained whilst on service; to whom application should be made; and if they were supplied free of cost to the men.—Mr. MACPHERSON replied: The Minister has arranged with a panel of dentists throughout the United Kingdom for the free supply of dentures to those ex-Service men who, as a result of illness or injuries due to service, require them. Application should be made by the man to his Local War Pensions Committee.—Mr. BRIANT: Does the right honourable gentleman know that Pensions Committees in some cases say that they cannot do anything for these men?—Mr. MACPHERSON: If the honourable gentleman will give me any case where there is difficulty I will look into it at once.—Dr. MURRAY: Who will determine whether the man is entitled to dental treatment? Will the Local War Pensions Committee be able to settle that question?—Mr. MACPHERSON: I think that must be decided beforehand. If he is entitled to a pension he is entitled to free dentistry.—Dr. MURRAY: Then he must go before a Pensions Board?—Mr. MACPHERSON: I think so.—Dr. MURRAY: Why should not the Pensions Board be in a position to order the treatment without all this circumlocutory delay?—Mr. MACPHERSON: I do not think there is any circuitous route at all. I think it is a very direct way. If he is entitled to a pension I have arranged for a panel of dentists throughout the country to which he can go. If he submits his claim to the Local War Pensions Committee every assistance will be given to him.—Mr. SPENCER: Is the right honourable gentleman aware that men who have contracted some form of disease have been ruled by local boards to have contracted it before service, and what can he suggest to obviate that?—Mr. MACPHERSON: That is so, but a man has a very fair trial. He has a full right of appeal on a question of entitlement to a tribunal, which is independent of the Ministry of Pensions.

FRIDAY, JULY 30TH.

Dangerous Drugs Bill.

The Dangerous Drugs Bill was read a third time.

Ex-Service Men in Asylums.

Brigadier-General SURTEES asked the Minister of Pensions if he would state how many ex-Service men were inmates of asylums in the United Kingdom; whether they were treated in the same manner as pauper lunatics; and what was the cost to the country of such ex-Service inmates.—Major TRYON (Parliamentary Secretary to the Ministry of Pensions)

replied: The number of disabled ex-Service men classified as Service patients is about 5000. As the charges for maintenance of these patients vary considerably in different parts of the country, it would entail more work than I feel justified in imposing on my staff to ascertain the total cost to the country.

TUESDAY, AUGUST 3RD.

Condemned Meat at Newcastle.

Mr. GRATTAN DOYLE asked the Food Controller if he had read the report of the corporation veterinary inspector of Newcastle-on-Tyne for the four weeks ending July 10th, 1920, relative to the quantities of meat received in that city which had been found to be unfit for human food; and, if so, if he could give any explanation of the state of affairs there disclosed.—Mr. MCCURDY replied: I have read the report of the corporation veterinary inspector of Newcastle-on-Tyne for the four weeks ending July 10th. I find that during that period a certain quantity of home-grown beef was found to be tuberculous and accordingly condemned. A large quantity of imported meat was also condemned, consisting partly of offals which had been brought in on transshipment from the Continent on private account, and partly of carcasses also sent on private account which appear to have been unsound for some time. Certain cases of rabbits were also condemned, which formed part of surplus army stock for which it had been found impossible to effect a sale. I am satisfied that the utmost vigilance is being exercised by the sanitary authorities at Newcastle-on-Tyne, and the honourable Member may rest assured that the Ministry of Food is doing everything in their power to assist them.—Dr. ADDISON (Minister of Health) said that he was making inquiries as to the position in regard to Newcastle, and will communicate with the honourable Member.

Children from South-Eastern Europe.

Mr. RONALD M'NEILL asked the Secretary for the Home Department whether the operations of the committee who were bringing to England children and young persons from Hungary and other parts of South-Eastern Europe were being conducted under his supervision and control; if he would say how many such children and young persons it was intended to bring to this country; whether stringent precautions were being taken to prevent the introduction of infectious disease; where and under what conditions were these immigrants being accommodated; whether any adults were being admitted with the children and young persons; and whether any similar hospitality and charity were being offered in England to children from allied countries who might be as much in need as children of late enemies.—Mr. SHORTT replied: The work of the committee is not supervised or controlled by me. 456 children from Vienna have already arrived and 400 more from Budapest are expected shortly. That is all I know of at present. Careful medical examination of the children before they start for this country is made under the supervision of a medical officer of the Ministry of Health, and on arrival they are placed in quarantine in a camp near Richborough. In due course they are distributed to various parts of the country, the whole process being supervised by the Ministry of Health. No adults are being admitted with the children. A Manchester committee has recently asked for and obtained permission to bring over a number of French children from the devastated areas of France for a period of recuperation in this country.

The Services.

ROYAL ARMY MEDICAL CORPS.

Major J. S. Dunne to be acting Lieutenant-Colonel.

Temp. Capt. A. Brown relinquishes the acting rank of Lieutenant-Colonel.

Temp. Capt. A. Farquhar relinquishes the acting rank of Major.

To be Captains: Capts. G. K. Maurice (from T.F.), D. McVicker (late temporary Captain, R.A.M.C.); Temp. Capts. A. E. Drynan, J. W. Malcolm, W. C. Connell; Lieuts. (Temp. Capts.) J. A. Cowan, J. P. Macnamara, J. W. Hyatt, T. Stanton, T. Parr, A. P. Draper, J. R. S. Mackay.

To be Lieutenants and to be Temporary Captains: Capts. R. R. Evans and F. K. Escritt (from Spec. Res.); Temp. Capt. L. Handy.

Hon. Capt. C. A. Hutchinson, late R.W. Kent R., to be Lieutenant.

Officers relinquishing their commissions:—Temporary Majors retaining the rank of Major: J. P. Campbell, R. Worth. Temporary Captains granted the rank of Major: H. H. O'Heffernan, D. C. McCabe-Dallas, D. Gillespie, P. Murphy, J. P. Mathie, A. Topping, (Acting Major) J. A. Mackenzie. Temporary Captains retaining the rank of Captain: J. A. Bateman, A. C. Greenwood, A. C. Wilson, F. C. Watson, R. C. De Lacey, G. B. McTavish, H. R. Hurry, A. M. Niven, G. Maclean, E. Tanton, A. J. C. Tingey, T. W. J. Childs, A. S. Sieger, A. W. C. Bennett, H. C. Hopkinson, B. G. H. Connolly, P. S. MacLaren, J. V. O. Andrews.

SPECIAL RESERVE OF OFFICERS.

Capt. A. H. Habgood relinquishes his commission and is granted the rank of Lieutenant-Colonel.

Officers relinquishing their commissions:—Capt. E. N. H. Gray. Captains granted the rank of Major: F. Crosbie, J. Gossip. Captains retaining the rank of Captain: R. Chevassut, R. H. Yolland, J. H. Davison, A. D. Gorman, T. H. McLeod, W. H. Palmer, D. J. Thomas, J. Kinnear, W. W. Nicol, P. T. Jones, J. W. Bowman, E. G. Fishe, A. B. Dummere, D. Stewart, W. C. MacKinnon, L. Walker, J. N. Jamieson, A. Black, J. Liddell, E. V. Beale, A. O. Bolton, D. Cameron, W. M. Casper, C. A. Harvey, R. B. Hick, R. L. Robinson.

TERRITORIAL FORCE.

Major H. A. T. Fairbank resigns his commission and is granted the rank of Lieutenant-Colonel.

Capt. A. K. Maclachlan resigns his commission and is granted the rank of Major.

INDIA AND THE INDIAN MEDICAL SERVICE.

Lieut.-Col. H. B. Melville, Residency Surgeon, Kashmir, has proceeded on leave owing to ill-health; Lieut.-Col. McIver Smith officiates. Major C. A. Gourlay has been appointed Civil Surgeon of the 24 Parganas and Protector Emigration and Superintendent Emigration, Calcutta. Lieut.-Col. A. Leventon has been granted six months' leave. Lieut.-Col. E. L. Perry, Deputy Sanitary Commissioner, Punjab, is appointed Sanitary Commissioner, vice Major W. A. Justice, Madras Government. Capt. J. S. S. Martin to hold Civil Medical Charge of Roorkee, in addition to his own duties, vice Capt. J. Cullonan, R.A.M.C. Major P. Goil, on reversion from military duties, has been appointed Civil Surgeon, Raishaki, vice Dr. R. S. Ashe. Major A. E. J. Lister, Professor of Physiology, King George's Medical College, Lucknow, has been granted combined leave for eight months. Major W. Lethbridge has been granted an extension of leave for six months. Lieut.-Col. H. Smith, Amritzsar, has been granted one year's leave. Capt. Charters has returned from military duty and is posted to Umbala.

I.M.S. Ex-Officer's Rank.

A Government communiqué announces that an officer in the I.M.S. holding a permanent or temporary commission whose service has been satisfactory throughout shall be granted permission to retain his rank on demobilisation. If, however, he held higher acting or temporary rank during the war for a minimum period of six months, or if his service on the active list terminated as the immediate result of sickness or wounds caused "in or by" the Service while holding the higher acting or temporary rank, he will be permitted to retain rank equivalent to such acting or temporary rank.

DEATHS IN THE SERVICES.

Surgeon-General William Gerard Don (retd.), who died at his residence, Canfield-gardens, N.W., on July 27th, in his eighty-fifth year, served as a medical volunteer in the flagship *Duke of Wellington* in the Baltic Fleet and at the battle of Sveaborg in 1855. He graduated M.D. at the University of Edinburgh in 1857, joined the Army Medical Service in the following year, and served in Central India during the Mutiny, being present at the actions with Tantia Topee at Rajpore and Beilkara (mentioned in despatches). In 1882 he was employed in fitting out hospital ships for the Egyptian Expedition. For 17 years he was senior medical officer to the London Recruiting Staff. Surgeon-General Don, who retired in 1885, was president of the Caledonian Society of London and a life-governor of the Royal Scottish Corporation.

THE HONOURS LIST.

The following promotions and appointments of medical officers for valuable services rendered in connexion with operations in Afghanistan are announced:—

C.S.I.—Maj.-Gen. H. Hendley, I.M.S.

C.I.E.—Lt.-Col. H. D. Packer, R.A.M.C.; temp. Lt.-Col. J. F. Haswell, R.A.M.C.; Maj. A. F. Babonau, O.B.E., I.M.S.

C.B.E.—Lt.-Col. (acting Col.) H. Boulton, I.M.S.; Col. P. Carr-White, K.H.P.; Lt.-Col. J. G. Gill, D.S.O., R.A.M.C.

O.B.E.—Capt. (acting Lt.-Col.) P. B. Bharucha, D.S.O., I.M.S.; Capt. H. S. Blackmore, R.A.M.C.; Maj. C. E. Bulteel, I.M.S.; Maj. (acting Lt.-Col.) A. Cameron, I.M.S.; temp. Capt. P. J. De Sousa, I.M.S.; temp. Lt. B. N. Gupta, I.M.S.; Capt. (acting Lt.-Col.) J. P. Huban, I.M.S.; temp. Capt. R. W. Murphy, R.A.M.C.; Capt. R. B. Myles, R.A.M.C.; Capt. F. H. B. Norrie, R.A.M.C. (S.R.); temp. Capt. A. P. Pillay, I.M.S.; Capt. and Bt. Maj. C. Ryles, R.A.M.C.; Maj. (acting Lt.-Col.) W. W. Browne, R.A.M.C.

M.B.E.—Temp. Capt. Y. B. Ranade, I.M.S.

To be Brevet Lieut.-Col.—Maj. R. S. Kennedy, D.S.O., M.C., I.M.S.

To be Brevet Major.—Capt. G. A. Blake, R.A.M.C.; Capt. (temp. Maj.) T. A. Hughes, I.M.S.

D.S.O.—Capt. and Bt. Maj. (temp. Maj.) E. E. Doyle, I.M.S.

M.C.—Capt. J. E. Carpenter, R.A.M.C. (S.R.); Capt. D. F. Murphy, I.M.S.

CALEDONIAN MEDICAL SOCIETY.—The annual meeting of this society was held in the Prince Charlie Room of the Public Library, Derby, on July 24th, under the presidency of Dr. Rutherford Macphail. The society makes a practice of holding annual meetings alternately in England and Scotland, but no annual gathering had actually occurred since 1914. Conditions of membership are Celtic blood and the possession of a university degree. The society, which has a membership of 300 in addition to some 25 honorary members belonging to other professions, gives special attention to old Celtic literature in relation to medical science. Dr. Macphail took as the subject of his address "Derby and the 'Forty-five.'" The annual dinner was held the same evening, when the toast of the society was proposed by Dr. F. Milnes Blumer, Mayor of Stafford. The next annual meeting will be held in Edinburgh, under the presidency of Emeritus Professor William Russell.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful in the undermentioned subject:—

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

Part I., Physics and Electrotechnics.—William Wallace Boyce, John Prichard Bracken, Noel Hawley Michael Burke, Henry Warner Collins, George Eldridge Dyas, Thomas Garfield Evans, William Christopher Long, Geoffrey Trevor Loughborough, Hector Bruce Mackenzie, Thomas Marlin, Harry Carew Nott, Claude Mallinson Rigby, Charles Allen Robinson, Stanley Wilson Shields, Johan van Roojen, Jocelyn Langton Waller, and Eva Muriel White.

Part II., Radiology and Electrology.—William Wallace Boyce, Henry Warner Collins, George Eldridge Dyas, Thomas Garfield Evans, Max Hermann Knoch, William Christopher Long, Geoffrey Trevor Loughborough, Hector Bruce Mackenzie, Thomas Marlin, Harry Carew Nott, Claude Mallinson Rigby, Charles Allen Robinson, Stanley Wilson Shields, Johan van Roojen, Eva Muriel White, and Justina Augusta Wilson.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary Comitia was held on July 29th, Sir Norman Moore, the President, in the chair. The minutes of the Censor's Board were read, and it was resolved—

"That Frederick Arthur Pring be declared to be no longer a Licentiate of the College, and that he forfeit all rights and privileges, and that his name be removed from the list during the pleasure of the College."

The President announced the following appointments:—Dr. F. Parkes Weber, to deliver the new Mitchell Lecture in 1921; Dr. George Graham, to be Goulstonian lecturer for 1921; Dr. Thomas Lewis, to be Oliver Sharpey lecturer for 1921; Dr. Arthur Whitfield, to be Lumleian lecturer for 1921; Dr. R. O. Moon, to be FitzPatrick lecturer for 1921; and Dr. Gordon M. Holmes, to be Croonian lecturer for 1922.—A grant of £100 was made to Sir F. W. Mott from the Croonian Trust for his researches.—Dr. Eardley Lancelot Holland was admitted to the Fellowship.—The following candidates, having passed the required examinations, were admitted as Members of the College:—Dr. A. C. Alport, Dr. F. V. Bevan-Brown, Dr. G. K. Bowes, Dr. H. C. H. Bull, Mr. W. S. Dawson, Dr. G. B. Dowling, Dr. H. Gardiner-Hill, Dr. T. J. H. Hoskin, Dr. J. Inkster, Dr. J. Joffe, Dr. J. W. McNee, Dr. T. H. Oliver, Dr. R. J. Perkins, Dr. J. H. Sheldon, Dr. G. J. Sophianopoulos, Dr. A. T. Stanton, Dr. H. Stott, Dr. R. J. C. Thompson, Dr. A. P. Thomson, Dr. A. G. Williams, Dr. T. P. Williams, Dr. Irene Yates.—Licences to practise physic were granted to 85 candidates who had conformed to the by-laws and regulations and passed the required examinations.—Diplomas in Public Health were granted jointly with the Royal College of Surgeons to 35 candidates.—The report of the examiners for the Murchison scholarship was received, and the scholarship was awarded to Roland John Perkins. John Vernon Cannadine Braithwaite, *proxime accessit*, was awarded a special scholarship of ten guineas.

The following College officers and examiners were elected on the recommendation of the President and Council:—Censors: Dr. Hector W. G. Mackenzie, Sir John Rose Bradford, Sir James Galloway, and Dr. John Fawcett. Sir Dyce Duckworth, Dr. J. A. Ormerod, and Dr. Arnold Chaplin were re-elected as Treasurer, Registrar, and Harveian Librarian respectively. Dr. Raymond H. P. Crawford was elected to the Library Committee, and Dr. G. F. Blacker to the Council, in place respectively of Dr. Mackenzie and Dr. Fawcett, elected censors.—The Fellows newly elected to office having given their faith to the College, the President announced that he had awarded the Bisset Hawkins medal to Dr. W. H. Hamer, and that he had nominated Sir William Hale White to serve on a committee appointed by the Minister of Health to advise upon the control of therapeutic substances, which cannot be tested by direct chemical means.—Dr. Dawson Williams was appointed to represent the College on the governing body of Birmingham University in the place of the late Dr. Samuel West.

A report was received from Sir Humphry Rolleston and Mr. H. J. Waring, representatives of the Royal Colleges, upon their visit to the examination held at Philadelphia, May 19th–26th, 1920, by the National Board of Examiners. This was referred to the Committee of Management after the President had spoken in highly appreciative terms of it.—A complete account of the proceedings of the Committee of Reference was received from the chairman, Dr. Sidney Martin. The thanks of the College were accorded to Dr. Martin and to Mr. F. G. Hallett, who acted as secretary to the Committee.—A report, dated June 9th, 1920, was received from the Representative of the College on the General Medical Council upon the proceedings of the Council at the meeting held in May–June last.—The annual report of the Cancer Research Fund was received and the thanks of the College were accorded to the Executive Committee.—A report from Sir George Savage concerning the Chelsea Physic Garden was received and entered on the minutes. Sir George Savage was reappointed a representative on the Committee of Management of the Chelsea Physic Garden.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary Council meeting was held on July 29th, Sir Anthony Bowlby, President, in the chair.—Sir D'Arcy Power was readmitted to the Council.—A Report from the Court of Examiners for the diploma of Member was read, and diplomas of Membership were granted to 84 candidates mentioned in the report.—The Council elected Mr. Evelyn Sprawson, *M.C.*, M.R.C.S., L.D.S., a member of the Board of Examiners in Dental Surgery.

Primary Examination for the Fellowship.—The Council recommended that in future one paper of four questions be set in anatomy, and in physiology one paper of six questions, four of which must be answered. (This was in pursuance of a recommendation from the Board of Examiners. At the present time two papers in anatomy and two papers in physiology are set, each containing four questions, of which the candidate must answer only two. This plan was introduced in 1913 in consequence of recommendations from the examiners and teachers of that time. Formerly there was one paper in each subject, each containing four questions, of which not more than three had to be answered.)

A letter from the dean of the Royal Dental Hospital of London School of Dental Surgery was read, reporting the following resolution adopted by the Medical Committee of the school:—

That the Medical Committee of the Royal Dental Hospital has recently considered in detail the education of the dental student, and is of the opinion that it would be a great advantage if students could be allowed to present themselves for examination in anatomy, physiology, and dental anatomy at the end of the first year of study at a general hospital.

The matter was referred to the Dental Board of Examiners to consider.

A report of the Committee of Management was read, approved, and adopted, recommending that—

(*a*) The following be added to the list of institutions recognised for the instruction in chemistry and physics—viz., the College, Bishop's Stortford; Victoria Institute, Worcester.

(*b*) The following be added to the list of institutions whose graduates in Medicine are admissible to the Final Examination of the Examining Board in England under the conditions of Par. IV., Section III. of the regulations—viz., the University of Virginia, Charlottesville, U.S.A.

(*c*) Sir Charles Ballance, K.C.M.G., C.B., M.V.O., be appointed visitor to the examinations of the Egyptian School of Medicine for the next period of examination.

A letter was read from Sir John Rose Bradford reporting the transfer of certain stocks into the name of "The Royal College of Surgeons of England" in pursuance of the undertaking of the College to become the trustees and administrators of the Lister Memorial Fund. The provisions of the trust, as we have already noted (THE LANCET, July 24th, p. 223), are: (1) That out of the general fund a sum of £500, together with a bronze medal, be awarded every three years, irrespective of nationality, in recognition of distinguished contributions to surgical science, the recipient being required to give an address in London under the auspices of the Royal College of Surgeons. (2) That the award be made by a committee constituted as follows: Two members nominated by the Royal Society; two members nominated by the Royal College of Surgeons of England; one member nominated by the Royal College of Surgeons in Ireland; one member nominated by the University of Edinburgh; one member nominated by the University of Glasgow. (3) That any surplus income of the general fund, after providing for the erection of a monument, and after defraying administering expenses, be either devoted to the furtherance of surgical science by means of grants or be invested to increase the capital of the fund.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of Comitia of the Royal College of Physicians and of the Council of the Royal College of Surgeons on July 29th diplomas of L.R.C.P. and M.R.C.S. were respectively conferred upon 85 candidates who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the by-laws of the Colleges. The following are the names and medical schools of the successful candidates:—

A. N. Aitken, Rush Medical Coll.; H. S. Baker, St. Bart.'s; W. J. Birchall, Liverpool Univ.; S. Blackman, London; T. L. Bonar, Cambridge and St. George's; J. P. Brown and G. N. Campey, Liverpool; L. E. R. Carroll and G. W. Cheater, Charing Cross; H. S. Cohen, London; Sarah Annie Cooper, Charing Cross; D. Crawford, Cambridge and St. Bart.'s; J. W. Crawshaw, Manchester; F. W. Crook, Guy's; K. V. Deakin, Manchester; S. N. Deboo, Bombay; G. L. J. A. de Rynck, Univ. Coll.; W. D. Doherty, Guy's; T. A. J. Duff, Toronto; R. S. Fawssett, St. Bart's; J. Flanagan, Liverpool; Ada Marion Freeman, King's Coll.; Blanche Sutton Gardner, Royal Free; A. D. Gill, Birmingham; C. I. C. Gill, Cambridge and

Guy's; Doris Elsie Florence Goodall, Birmingham; E. E. D. Gray, Guy's; Hilda Treloggen Haggett, Royal Free; Gertrude Eleanor Harre, St. Mary's; H. A. Harris, Univ. Coll.; F. Heber, London; L. W. Hefferman, Middlesex; Sylvia Kema Hickson, Manchester; G. F. W. Howorth, Middlesex; H. V. Jackson, Bristol; F. J. Jauch, Middlesex; Marjorie Mary Jefferson, Manchester; Doris Eleanor Parker Jolly, King's Coll.; Silas G. Jones, Liverpool; Dorothy Maud Kemp, Royal Free; A. W. Kirkham, Manchester; J. N. Laing, St. Bart.'s; P. T. Liang, Cambridge and St. Thomas's; H. A. Lomax, Manchester; Mary Alice McHugh, Liverpool; G. J. W. McMichael, Univ. Coll.; R. T. McRae, London; Dora Mason, Royal Free and St. Mary's; W. F. Matthews, King's Coll.; L. B. Maxwell, St. Thomas's; Eva Morton, Royal Free; L. Moss, Guy's; Annie Agnes Muir, Liverpool; B. P. Nanavati, Bombay and London; C. W. Narbeth and D. G. F. Moore, St. Bart.'s; D. J. P. O'Meara, Guy's; R. Y. Paton, Cambridge and St. Mary's; P. H. Perera, Ceylon and London; J. Posner, Dublin; G. H. Potter, Liverpool; M. R. Rana, Bombay and Middlesex; G. K. Reeves, Guy's; M. H. Renall, St. Bart.'s; E. L. Robert and L. C. Rogers, Middlesex; W. R. Sadler, St. Bart.'s; J. A. P. Shaw, Cambridge and St. Thomas's; G. Sheehan, Manchester; F. D. Spencer, Birmingham; A. D. Stoute, Boston and Westminster; P. W. Symons, Middlesex; H. Tomlinson, Manchester; B. M. Tonkin, Guy's; M. Tree, London; Edith Helen Trimmer, St. George's; N. S. B. Vinter, St. Bart.'s; R. P. Wanless, Durham and Oxford; Helena Jane Webster, Westminster; C. H. Whittle, Cambridge and King's Coll.; Dorothea Compston Wigfield, Royal Free; W. R. Williams, Liverpool; and S. Wright and C. R. Young, Middlesex.

DIPLOMA IN PUBLIC HEALTH.

The Diploma in Public Health has been granted to the following 35 successful candidates:—

Lewis Anderson, King's Coll.; Kaikhushroo Maneckji Bharucha, Bombay and Univ. Coll.; Gordon Thomas Calthrop, Cambridge and Univ. Coll.; Arthur Skelding Cane, Cambridge and St. Bart.'s; Thomas Philips Cole, Guy's and King's Coll.; Delphine Gertrude D'Abreu, Univ. Coll.; Cuthbert Esquire Dukes, Edinburgh and Univ. Coll.; Reginald Oliver Eades and Hugh Alderson Fawcett, Univ. Coll.; Hubert John Burgess Fry, Oxford and Univ. Coll.; Andrew Radburne Fuller, St. Mary's and Univ. Coll.; Arthur Henry Habgood, Cambridge and London; Ronald Nelson Hunter, London and Middlesex; John Herbert Jordan, Cambridge and Middlesex; John du Plessis Langrishe, Dublin; Edward Richardson Lovell, Middlesex; Herbert Cubitt Lucey, Guy's; James Macalister Mackintosh, Glasgow and King's Coll.; Charles Arthur Mason, Edinburgh and Univ. Coll.; Edgar William Matthews, King's Coll.; William John Moir, Aberdeen and Univ. Coll.; Framroz Nanabhoy Moos and Dennis Salmon Page, Univ. Coll.; Wyndham Parker, Edinburgh and Univ. Coll.; Parmanand, Punjab and Univ. Coll.; Arthur Borland Porteous, St. Mary's; William Bentley Purchase, Cambridge, London, and Univ. Coll.; Maitland Radford, Univ. Coll.; Rowan William Revell, Middlesex; Frederick Emilius Roberts, St. George's; Arthur Burch Rosher, Charing Cross; Hugh Stott, Guy's; Wilfrid Reginald Taylor, St. Mary's; John Newton Webb, Adelaide and Univ. Coll.; and Augustus Joseph Wernet, Royal Naval College, Greenwich.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates have passed the Triple Qualification Examination:—

THIRD EXAMINATION.

Edward James Allan, Jemina Marianna M'Kechnie Calder, James M'Nie Campbell, Dominic Ciantar, William Arthur M'Kie Gibson, William Gray, Gerrit Johannes Lamprecht, Ian Fleming M'Ash, Saros Ardishair Dadabhai Naoroji, James Readdie, Sidney Sack, Joseph Alfred Henry Sykes, Enid Anne Williams, and Lilian Mary Williams.

FINAL EXAMINATION.

George Green, James Stewart Durward, Muriel Keyes, William Ewart de Silva, William Barton, Benjamin Belilovsky, Frederic James Stevenson, Jesse Hayna Crawford, Agnes Macilwraith Hill, Karthegesa Ponniah, Andrew Gold, Arthur Henry Jacobs, Frank Arthur Smorfitt, Jessie Melville Lyell Wright, Percival Charles Holden Homer, Sidney Scott Sumner, William M'Mullan, Israel Goldberg, Oswald Brunlees, Douglas Chiene Scotland, Thomas Poole, James M'Glashan, John Stevenson, May Constance Boughton-Leigh, Thomas Hardie, and Thomas Arnoldus du Toit.

UNIVERSITY OF BRISTOL.—The Markham Skerritt prize, awarded every three years to that medical member of the University of Bristol who in the opinion of the board of the Faculty of Medicine has in the previous three years published the best original work in any branch of medical science, has recently been awarded to Professor F. H. Edgeworth and Mr. E. W. Hey Groves. During the war no award was made.

THE first post-graduate course held under the joint auspices of the Council of the College of Medicine, the honorary medical and surgical staff of the Royal Victoria Infirmary, Newcastle-on-Tyne, and the British Medical Association (North of England) has just been completed. The course was well attended and has been in every way a complete success. This success and the wish expressed by a large number of practitioners has encouraged the committee to continue the courses during the coming winter. The syllabus, which is under consideration at present, will be a revised and extended one, and a further announcement will appear in due course.

LONDON HOSPITALS: DISTRIBUTION OF SURPLUS RED CROSS FUNDS.—The Joint Finance Committee of the British Red Cross Society and the Order of St. John of Jerusalem, having invited the King's Fund to undertake the distribution of £250,000 out of the surplus funds at the disposal of the Committee amongst London hospitals, this has now been done upon conditions similar to those on which the Joint Committee had already made a distribution of surplus funds amongst hospitals outside London.

Certain conditions were to be attached to this distribution, e.g.:—

(*a*) That the distribution should be confined to hospitals in the London area that could and would treat ex-sailors or ex-soldiers.

(*b*) That it should take the form of capital grants in aid of definite schemes of extension or improvement that would directly or indirectly increase the facilities for the treatment of ex-Service men, no part of it being available for maintenance or for the payment of debts.

(*c*) That before any grant was actually paid over the scheme must be mature.

These conditions exclude from the special distribution certain hospitals, such as those providing for women and children only, eligible for the Fund's ordinary distribution, and include others ineligible under the ordinary rules. Applications were considered from 64 hospitals in respect of 81 schemes, and grants were recommended to 49 of these in respect of 54 schemes. The amount and purpose of the particular grants are as follows:—

Acton Hospital, £2500, extension, new out-patient department.

Beckenham Cottage Hospital, £2250, extension, new operating theatre.

Charing Cross Hospital, £1250, improvements to X ray department, nurses' home.

City of London Hospital for Diseases of the Chest, Victoria Park, £4000, surgical block and sanitary and other improvements.

Croydon General Hospital, £1000, additional nurses' accommodation (subject to the provision of fire exit).

Dreadnought Hospital, £7000, erection of sanatorium for tuberculous seamen at Bramshot, Hants.

East Ham Hospital, £9000, rebuilding as general hospital.

Finchley Cottage Hospital, £1750, extension, new administration block.

French Hospital, £2000, enlarged nurses' and servants' quarters, enlarged out-patient department, additional beds, and other improvements; in the order stated.

Great Northern Central Hospital, £15,500, new nurses' home, new boilers, and new kitchen; in the order stated.

Guy's Hospital, £11,000, nurses' home extension and special out-patient departments.

Hampstead General Hospital, £1000, electrical and physical departments, and other improvements.

Hendon Cottage Hospital, £600, new operating theatre, X ray room, and improved nurses' accommodation.

Hornsey Cottage Hospital, £1500, extension, new operating theatre.

Hospital for Consumption, Brompton, £7000, extension of sanatorium at Frimley.

Hospital for Diseases of the Throat, £2500, rebuilding of amalgamated hospital.

Hospital for Epilepsy and Paralysis, £2000, extension of out-patient department.

King's College Hospital, £1000, equipment of wards, theatres, and special departments.

London Homœopathic Hospital, £1250, improvements to boilers, lighting, lifts, heating.

London Hospital, £3500, new massage and electrical departments.

London Jewish Hospital, £1250, extension of in-patient department, kitchen, operating theatre.

London Temperance Hospital, £6000, new nurses' accommodation, improvements to isolation ward; provided that the Hospital Committee are satisfied that the ward already vacant and the ward vacated by the scheme can both be opened to patients.

Middlesex Hospital, £2700, new night nurses' home.

Middlesex Hospital Cancer Charity, £300, new night nurses' home.

Mildmay Mission Hospital, £2500, fire escape staircase, enlarged nurses' home, new operating theatre, and other improvements; on condition that the staircase is put in hand immediately.

Miller General Hospital for South-East London, £15,000, extension, new nurses' home, kitchen, and out-patient, casualty, and pathological departments.

National Hospital for Diseases of the Heart, £2000, extension of out-patient department.

National Hospital for the Paralysed and Epileptic, £1000, provision of out-patient operating room, and improvements to in-patient theatre.

Nelson Hospital for South Wimbledon, £2500, extension, additional nurses' rooms.

Norwood Cottage Hospital, £300, additional rooms and new X ray apparatus.

Passmore Edwards Hospital for Willesden, £8000, extension as general hospital.

Poplar Hospital, £6000, improved casualty department.

Prince of Wales's General Hospital, £10,000, extension, additional nurses' rooms.

Queen Mary's Hospital for the East End, £12,000, new nurses' home and in-patient operating theatre, subject to the submission of block plan for ultimate utilisation of complete site.

Royal Free Hospital, £8500, nurses' home and extension, in the order stated.

Royal National Orthopædic Hospital, £24,000, extension of out-patient department, X ray, electrical, exercise and Swedish drill rooms, nurses' bedrooms.

St. Bartholomew's Hospital, £24,000, new nurses' home.

St. John's Hospital, Lewisham, £1250, new out-patient department.

St. John's Hospital for Diseases of the Skin, £400, new nurses' accommodation.

St. Mark's Hospital, £600, new nurses' rooms.
St. Paul's Hospital for Skin, &c., £1500, new hospital in Endell-street.
St. Peter's Hospital for Stone, £600, new nurses' rooms, X ray rooms.
St. Thomas's Hospital, £2500, enlargement of nurses' dining room.
University College Hospital, £500, re-equipment of radiographic and electrical department.
West End Hospital for Nervous Diseases, £2500, removal to Regent's Park, improved nurses' accommodation at Regent's Park, and reconstruction of out-patient department at Welbeck-street. Of the grant of £2500, £500 is subject to the carrying out of the scheme for the provision of a new nurses' home at Regent's Park.
Western Ophthalmic Hospital, £2000, reconstruction and extension.
West London Hospital, £8000, new out-patient department.
Wimbledon Hospital, £1500, new nurses' home, and resident medical officer's quarters.
Woolwich War Memorial Hospital, £25,000, building of general hospital.

In making their allotment the Distribution Committee of the King's Fund has particularly borne in mind the importance of not unduly encouraging the provision of additional beds, and it was ultimately decided that much the larger proportion of the gift should be devoted to improvements involving only comparatively small additional expenditure on maintenance. The amount devoted to schemes other than bed extensions has been used to assist numerous improvements, which are no less important from the point of view of the treatment of ex-Service men, and often of greater urgency. They include the enlargement of out-patient accommodation, the improvement or equipment of massage, electrical, and X ray departments, new operating theatres, and the provision of better accommodation for nurses. The Distribution Committee had no hesitation in regarding nurses' homes as improvements within the scope of the special distribution.

The distribution is the subject of comment in a leading article in our present issue.

A POST-GRADUATE WEEK AT OXFORD.—A post-graduate course is to be held in the Radcliffe Infirmary and County Hospital at Oxford, conducted by members of the staff, from Friday, Oct. 1st, until Saturday, 9th. Those attending the course will be asked to contribute a nominal subscription of 10s. towards the incidental expenses. A social dinner will form part of the arrangements. Further particulars from Dr. H. A. B. Whitelocke, Radcliffe Infirmary, Oxford.

THE National Council for Combating Venereal Diseases has a vacancy for a medical man on the Commission which it is proposed to send to the East Indies and China in the autumn. Fuller particulars will be found in our advertising columns.

THE Department of Scientific and Industrial Research has now established four Subcommittees to assist the Radio-Research Board in the investigation of certain problems in connexion with the work of the Board. The Board and its Subcommittees are strongly constituted, the latter dealing with the propagation of wireless waves, atmospherics, directional wireless, and thermionic valves.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).—Dr. A. C. D. Firth has been appointed Tutor to Cambridge Students, Dr. Raymond Crawfurd Tutor to Oxford Students, and Dr. J. A. Drake Demonstrator in Dermatology and Sub-Dean of the Medical School. A "Burney Yeo" Entrance Scholarship of £80 has been awarded to Mr. F. W. Furniss, B.A., of Downing College, Cambridge.

EASTERN COUNTIES CENTRE FOR ARTIFICIAL LIMBS.—The Ministry of Pensions has established a branch centre for the fitting of artificial limbs for ex-soldiers and sailors living in the Eastern Counties. A large house called Fernhill, standing in its own grounds in a suburb of Norwich, has been utilised. It had been used during the war as a military hospital, and is well adapted for its present purpose. Beds are available for 30 pensioners, and the ex-soldier or ex-sailor who requires an artificial leg stays for 14 to 16 days while his new limb is being made and fitted. There is a resident surgeon who superintends the fitting from a surgical point of view. A member of the firm of Messrs. Charles Salmon and Sons, of London, who has been carrying out the same work in France, is in charge of the whole process of making and fitting in a series of workshops equipped for the purpose. The "trees" of the legs are made of willow, obtained near Thetford. The Norfolk willow is specially suitable on account of its lightness and close grain. The rough trunks are cut into suitable lengths, a large hole being bored through the centre of each, and are then left in a dry shed to season. Though there is a standard pattern, each artificial leg is made to match the remaining sound leg, casts being taken for the purpose. Most of the men have already had artificial legs made in France, and are now in need of new ones. Since the opening of the depôt two months ago about 120 men have been supplied. Artificial arms are not at present made in the depôt.

THE LATE DR. E. J. TULK-HART.—Eugene John Tulk-Hart, M.D. Durh., M.R.C.S., L.S.A., who died rather suddenly on July 28th, at the age of 73 years, was one of the oldest medical practitioners in Brighton, where his kindly disposition and sympathetic interest had secured for him a large circle of friends. He retired from practice some years ago in favour of his son.

THE PORTRAIT OF SIR MICHAEL FOSTER.—The portrait of Michael Foster, recently presented by his son, Dr. Michael Foster, to the National Portrait Gallery, was painted by the Hon. John Collier in the autumn of 1906, and is a striking presentment of the great physiologist. Michael Foster sat for the portrait at the request of the artist, who afterwards gave him the picture in token of the long and unbroken friendship existing between Foster and Huxley, Collier's father-in-law. The portrait was exhibited at the Royal Academy in 1907, the last sitting by the distinguished subject having taken place only a week before his death. A replica of the head was given by request by Mr. Collier to the Royal Society, in whose rooms it now hangs in memory of an extended and distinguished secretaryship. At Lady Foster's death the original portrait passed into the possession of Dr. Michael Foster, with the request that it should be presented to the National Portrait Gallery, a request that was carried out by Dr. Foster immediately on his return from active service in France in 1919. Not only Michael Foster's many friends, and large body of distinguished and attached students, but all the medical profession will recognise that the public acknowledgment of his great worth, thus obtained, has been well deserved.

THE CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.—This amalgamation of the Incorporated Society of Trained Masseuses and the Institute of Massage and Medical Gymnastics has been formed under Royal Charter for the purpose of affording protection to the profession of massage and to its registered members. It has the following programme:—To improve the training and status of masseuses and masseurs; to provide and supervise independent examinations; to set up registers of persons qualified to practise; to arrange post-graduate courses, lectures, and conferences; to supply work for members under registry regulations; and to work in all ways for the advancement and general welfare of the profession. Registration with the Chartered Society is open to all certificate holders of the Incorporated Society and of the Institute. Test examinations will be set up for the benefit of masseuses and masseurs of experience, holding certificates other than the above-mentioned, who wish to register with the Chartered Society. Forms of application for registration and all information can be obtained from the offices of the society, 157, Great Portland-street, W.1. The Chairman of Council of the Chartered Society is Sir E. Cooper Perry, and the Queen has consented to become Patroness.

THE LATE DR. J. NEEDHAM.—Joseph Needham, whose strenuous work in army hospitals during the war impaired his health, died on August 2nd, aged 67. Educated at the London Hospital and at Aberdeen, he won a London Hospital medical scholarship in 1875, in which year he qualified with the M.R.C.S. Eng. Four years later he graduated at Aberdeen University M.B., C.M., taking the highest honours and special honours for a graduation thesis, and in the next year, 1880, became a Member of the Royal College of Physicians of Edinburgh. After holding house appointments at the London Hospital and becoming assistant to the professor of anatomy in the University of Aberdeen, he was appointed demonstrator of histology at the London Hospital Medical College and at the London School of Medicine for Women. He was anæsthetist to the 3rd London General Hospital and to the Kensington Red Cross (Weir) Hospital, medical officer to the Education Department of the London County Council, and surgeon to the Metropolitan Police.

CENTRAL MIDWIVES BOARD.—A special meeting of the Central Midwives Board was held at Queen Anne's Gate Buildings, Westminster, on July 22nd, with Professor H. Briggs in the chair, the chairman of the Board, Sir Francis Champneys, Bart., being absent through illness. This is the first occasion since the Board was first constituted on which the chairman has been absent. Two midwives were struck off the roll; one was cautioned and in other cases sentence was postponed, the following charges, amongst others, having been brought forward:—

That being in attendance at a confinement and the child suffering from inflammation of or discharge from the eyes, and continuing so to suffer, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E.21 (5), and she discontinued her attendance at a time when the child was so suffering as aforesaid. Medical aid having been sought for a patient the midwife neglected to notify the local supervising authority thereof, as required by Rule E.22 (1) (a), and she did not keep her register of cases, as

required by Rule E. 24. A child suffering from convulsions and dangerous feebleness and the midwife having explained that the case was one in which the attendance of a registered medical practitioner was required, she neglected to hand to the husband or the nearest relative or friend present the form of sending for medical help, properly filled up and signed by her, in order that this might immediately be forwarded to a medical practitioner or to an approved institution, as required by Rule E. 20 and 21 (5). A child having died before the attendance of a registered medical practitioner, the midwife neglected to notify the local supervising authority thereof, as required by Rule E. 22 (1) (b), and she did not at each visit record the pulse and temperature of the patient in a notebook or on a chart carefully preserved, as required by Rule E. 14. A presentation being other than the uncomplicated head or breech, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (3); she did not stay with the patient after the commencement of the second stage of labour until the expulsion of the placenta and membranes, as required by Rule E. 7, and she neglected to pay to the patient a sufficient number of visits to satisfy the requirements of Rule E. 12. A case being one of puerperal fever or other condition supposed to be infectious, the midwife neglected to notify the local supervising authority that she was herself liable to be a source of infection, as required by Rule E. 6, E. 22 (1) (e), and E. 23, Form (e). Being suspended from practice by the local supervising authority for the purpose of preventing the spread of infection under Rule F. a midwife during the period of suspension paid visits to the maternity patients upon whom she had been in attendance at the date of such suspension.

THE LATE DR. F. J. H. BATEMAN.—Francis John Harvey Bateman, who died from heart failure while about to leave his residence for a holiday at Torquay, was 51 years of age, and was the son of the late Sir Frederick Bateman, M.D. Educated at Norwich Grammar School and at Pembroke College, Cambridge, he subsequently studied medicine at Edinburgh and Paris. After graduating M.B., C.M. at Edinburgh in 1898 he held resident posts at the Royal Infirmary in that city and at the Leith Hospital. He graduated also B.A. and M.A. at Cambridge in 1890 and 1901 respectively, proceeding to the M.D. Edinburgh in 1905. For a time he acted as assistant medical officer to the West Riding Asylum, Wakefield, and later went to Paris as resident medical officer to the Hertford British Hospital, and worked while there at the Pasteur Institute and at the French hospitals. Dr. Bateman was a vice-president of the Medical Society of London, a Fellow of the Obstetrical Society, a member d'Alliance Franco-Britannique, and a J.P. for the County of London. Among his appointments were those of medical officer to the Blackheath and Charlton Hospital, the Belmont Home for Ladies, the Dartmouth Home for Crippled Boys, Blackheath, and the St. Dunstan's Annexe for Blind Soldiers, Blackheath, while he was also medical adviser to the Blackheath High School.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on July 13th, 19 cases were considered, and £202 5*s.* voted to the applicants. The following is a summary of some of the cases relieved:—

Daughter, aged 60, of M.R.C.S. Eng. who practised at Marske-by-the-Sea and died in 1869. Applicant's only income is £28 a year from investments. She acts as general help in a home in return for food and fire. She suffers from chronic ill-health, and has had several operations. Her invalid sister lives with her, and she is quite incapable. Voted £10 in two instalments.—Widow, aged 64, of M.D. Mast Surgeon who practised in Jamaica and died in 1889. Applicant's only income is £54 16*s.* from another charity. She lives alone, and friends pay the rent. Cannot manage at present owing to the high cost of living. Voted £5.—Daughter, aged 50, of M.D. Dub. who practised at Douglas, Isle of Man, and died in 1882. Suffers from ill-health and is unable to work. She receives £50 from friends and £7 10*s.* from investments. Shares home with a friend, and pays part rent. Asks for further help, owing to the high cost of living. Relieved five times, £22. Voted £5.—Daughter, aged 70, of M.R.C.S. Eng. who practised at Buxton and died in 1878. Applicant is a trained nurse, but cannot earn much now on account of her advanced age. She has no other income but what she earns, and lives with her sister, who has to keep her. Relieved twice, £30. Voted £18 in 12 instalments.—Widow, aged 71, of M.D. Glasg. who practised at Dennistoun and died in 1876. Her only income is £20 from another charity. She lives with her married daughter, who can scarcely afford to keep her. She is crippled with rheumatism. Relieved six times, £78. Voted £18 in 12 instalments.—Widow, aged 59, of F.R.C.S. Edin. who practised in London and died in February, 1919. Applicant's husband had received help from the Fund. On the death of her husband she took a post as temporary clerk at £2 a week, but has now had to give this up, and asks for help until she obtains another post. No other income. Rent 8*s.* a week. Relieved once, £5. Voted £5.

Subscriptions may be sent to the honorary treasurer, Sir Charters J. Symonds, at 11, Chandos-street, Cavendish-square, London, W.1.

BOOKS, ETC., RECEIVED.

AMERICAN PEDRIATIC SOCIETY, 1805 Spruce-street, Philadelphia.
Transactions (June 16th, 17th, 18th, 1919). Edited by O. M. Schloss, M.D. Pp. 270.

ARNOLD, EDWARD, London.
Lectures on Surgery to Nurses. By A. H. Todd, B.Sc., M.S. Pp. 270. 7*s.* 6*d.*
Medical Gymnastics in Medicine and Surgery. By E. B. Clayton, M.B. Pp. 159 5*s.*

BAILLIÈRE, TINDALL, AND COX, London.
Diagnosis of Bacteria and Blood Parasites. By E. P. Minett, M.D. 3rd ed. Pp. 94. 7*s.* 6*d.*
Aids to Osteology. By P. Turner, B.Sc., M.S. 2nd ed. Pp. 187. 4*s.* 6*d.*
Nurses' Complete Medical Dictionary. 2nd ed. Edited by Constance M. Douthwaite. Pp. 206. 3*s.*
The Duties of Sisters in Small Hospitals. By Félicie Norton. Pp. 75. 4*s.* 6*d.*

FROWDE, HENRY, AND HODDER AND STOUGHTON.
Infectious Diseases: A Practical Text-book. By C. B. Ker, M.D. 2nd ed. Pp. 628. £2 2*s.*

LEHMANN, J. F., München.
Erkennung der Geistesstörungen (Psychiatrische Diagnostik). Von Prof. W. Weygandt. Pp. 250. M. 34.
Diagnostik innerer Krankheiten in Tabellenform. Von Dr. A. J. Cemach. M. 15.
Atlas und Grundriss der Bakteriologie und Lehrbuch der speziellen bakteriologischen Diagnostik. Teil I.: Atlas. 79 plates. Teil II.: Text. Pp. 847. Von Prof. Dr. K. B. Lehmann, Direktor des Hygienischen Institutes in Würzburg, und Prof. Dr. Med. et Phil. R. O. Neumann, Direktor des Hygienischen Institutes in Bonn. 6. Auflage. Durch einen Nachtrag ergänzter Neudruck der 5. Auflage. M. 60.

LONGMANS, GREEN, AND CO., London and India.
The Essentials of Histology. Descriptive and Practical for the Use of Students. By Prof. Sir Edward S. Schafer, F.R.S. 11th ed. Pp. 577. 14*s.*
Sanitary Law in Question and Answer for the Use of Students of Public Health. By C. Porter, M.D. 2nd ed. Pp. 180. 6*s.* 6*d.*

THIEME, G., Leipzig.
Anatomie des menschlichen Gehirns und Rückenmarks auf myelogenetischer Grundlage. Von Paul Flechsig. Pp. 68 and 24 plates.
Grundriss der Augenheilkunde. By Prof. A. Brückner and Prof. W. Meisner. Pp. 650
Grundriss de Physiologie (Biochemie). By C. Oppenheimer. Pp. 522.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE.
MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.
A Course of Twelve Lectures on Neurology, open to Students and Graduates of the London Hospital and other Schools—
TUESDAY, August 10th.—2 P.M., Lecture IX.:—Dr. Riddoch: Disorders of Reflex Functions from Lesions of the Spinal Cord.
WEDNESDAY.—2 P.M., Lecture X.:—Dr. Thompson: Symptoms and Causes of Paraplegia.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, August 9th.—12.15 P.M., Dr. Burnford: Pathological Demonstration. 4.30 P.M., Mr. D. Armour: Subphrenic Abscess.
TUESDAY.—12 noon, Mr. T. Gray: Demonstration of Fractures, &c. 4.30 P.M., Mr. Banks Davis: Clinical Lecture:—II., Throat and Ear.
WEDNESDAY.—11.30 A.M., Mr. MacDonald: Demonstration of Cystoscopy. 2.30 P.M., Mr. D. Armour: Demonstration of Surgical Cases.
THURSDAY.—10.30 A.M., Dr. Simson: Gynæcological Demonstration. 4.30 P.M., Mr. B. Harman: Employer's Liability in Eye Injuries.
FRIDAY.—12.15 P.M., Dr. Burnford: Applied Pathology. 4.30 P.M., Mr. D. Buxton: Common Diseases and Injuries affecting the Buccal Cavity, their Recognition and Treatment.
SATURDAY.—12 noon, Mr. N. Sinclair: Surgical Diseases of the Abdomen.
Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.
MONDAY, August 9th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

CANCER HOSPITAL, Fulham-road, S.W.
Clinical Lectures on the Diagnosis and Treatment of Cancer.
TUESDAY, August 10th.—4.30 P.M., Mr. R. H. J. Swan: Cancer in the Urinary Tract.
FRIDAY.—4.30 P.M., Dr. A. Leitch: How Cancer Spreads.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

MCINTOSH, T. S., M.D. Edin., has been appointed Medical Officer of Health for Hendon.

SHATTOCK, C. E., M.D., M.S., F.R.C.S., Assistant Surgeon to the Royal Free Hospital.

SINCLAIR, N. F., F.R.C.S. Edin., Assistant Surgeon to the West London Hospital.
SMITH, E., M.D. Lond., Coroner for North-East District of London.

Certifying Surgeons under the Factory and Workshop Acts: GAYNOR, G. C., M.B., B.Ch. N.U.I. (Wymondham); ARMSTRONG, C. (Dulais Valley).

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne Union.—Asst. Med. Supt. and M.O. £368 10s.
Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £250.
Battersea General Hospital (Incorporated), Battersea Park, S.W.—Third Res. M.O. £200.
Bengal, University of Dacca.—Chair of Physical Education. Rs. 9000 to Rs. 12,000.
Birmingham General Dispensary.—Res. M.O. £400.
Birmingham General Hospital.—Res. M.O. £155. Also Obst. H.S., H.S., and Cas. H.S. £100 each. Also Res. Anæsth. £100. Also H.S. £125.
Birmingham University.—Lect. in Physiology. £250. Demonstrator in Pathology. £350.
Blackpool, Victoria Hospital.—H.S. £300–£350.
Bournemouth, Royal Victoria and West Hants Hospital.—Res. M.O. £200.
Bristol Eye Hospital.—H.S. £150.
Cancer Hospital, Fulham-road.—Asst. P. and Med. Reg. £250.
Chester Royal Infirmary.—H.P. £150.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Coventry Education Committee.—Two Sch. Dentists. £500.
Derby Borough Mental Hospital.—Asst. M.O. £350.
Derby County Borough Education Committee.—Asst. Sch. M.O. £500.
Dreadnought Hospital, Greenwich.—H.S. and H.P. £100.
Fulham Metropolitan Borough.—M.O. for Infant Welfare Centres. £2 2s. per session.
Gartnavel, Glasgow Royal Asylum.—Asst. M.O. £300.
Hertford County Hospital.—H.S. £200.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P.
Hove, Carr-Burton Memorial Hospital, Sackville-road.—Res. M.O. £250.
Isle of Ely County Council.—Clin. Tuberc. O. and Asst. M.O.H and Sch. M.O. £600.
Keighley Borough Education Committee.—Female Asst. M.O. £500.
King's Lynn, West Norfolk and King's Lynn Hospital.—Res. M.O. £150.
Leasowe Hospital for Children, Cheshire.—Jun. M.O. £200.
Leavesden Mental Hospital, King's Langley, Herts.—Jun. Asst. M.O. £515.
Leicestershire and Rutland Mental Hospital, Narborough, near Leicester.—Jun. Asst. M.O. £300.
Lincoln County Hospital.—Jun. H.S. £150.
Liverpool, David Lewis Northern Hospital.—Two H.P.'s and Three H.S.'s. £120.
Liverpool, Fazakerley Sanatorium.—Asst. Res. M.O. £300.
Liverpool, Royal Children's Hospital.—Hon. P. and Hon. Asst. S.
Liverpool, Royal Southern Hospital.—Two H.P.'s and Three H.S.'s. £100.
Liverpool School of Tropical Medicine.—Three Medical Men for Clinical and Research Work in Tropical Medicine.
London County Council Mental Hospital Service.—Asst. M.O.'s.
London Temperance Hospital, Hampstead-road, N.W.—Cas. O. £200. Also Radiographer. £105.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Maidstone, West Kent General Hospital.—H.S. £250.
Manchester, Ancoats Hospital.—H.S. £150.
Manchester, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £300.
Manchester Children's Hospital, Pendlebury, near Manchester.—Two Res. M.O.'s. £150.
Manchester, Crossley Sanatorium, Delamere Forest, Cheshire.—Asst. M.O. £350.
Manchester, Hulme Dispensary, Dale-street.—H.S. £400.
Manchester Royal Infirmary.—Res. M.O. £250.
Mile-End Old Town, Hamlet of.—Second Asst. M.O. £300.
Miller General Hospital for South-East London.—H.S. £150.
National Council for Combating Venereal Diseases.—Medical Member of Commission to East Indies and China.
Newcastle-upon-Tyne Education Committee.—Dental S. £400.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Lect. on Med. Jurisprudence. Sen. and Jun. Demonstrators of Anatomy. £450 and £350 respectively.
Preston Royal Infirmary.—Res. M.O. £180.
Queen Mary's Hospital, Stratford, E.—H.P.
Royal Free Hospital, Gray's Inn-road, W.C.—Obst. H.S. £50.
Salford Union Infirmary.—Res. Asst. M.O. £350.
Sheffield Royal Infirmary.—H.P. £150.
Southport General Infirmary.—Sen. H.S. and Jun. H.S. £250 and £175 respectively.
Stafford, Staffordshire General Infirmary.—H.S. £250.
Stockport General Infirmary.—Jun. Res. S. £200.
Sunderland Royal Infirmary (Children's Hospital).—Female Jun. Res. M.O. £150.
Surrey County Council.—Tuberc. M.O. £770.
Swansea General and Eye Hospital.—Jun. H.S. £200.
Swindon Borough.—M.O.H. and Med. Supt. of Isolation Hospital. £900.
Taunton and Somerset Hospital.—Sen. and Jun. H.S.'s. £200 and £150.
Tiverton Hospital, Devon.—H.S. £100.
University of London.—Prof. of Med. and Director of Med. Clin. £2000. Chair of Radiology. £1000.

Births, Marriages, and Deaths.

BIRTHS.

DE SMIDT.—On July 21st, at Blinco-grove, Cambridge, the wife of F. P. G. de Smidt, M.R.C.S., L.R.C.P., D.P.H., of a daughter.

MARRIAGES.

AITCHISON—FAIRBAIRN.—On July 27th, at New North United Free Church, Edinburgh, Captain R. Chalmers Aitchison, R.A.M.C., to Jessie Cunningham, daughter of the late Mr. and Mrs. David B. Fairbairn of Dunraven, Balerno, Midlothian.

DEATHS.

BATEMAN.—On August 2nd, suddenly, Francis John Harvey Bateman, J.P., M.A., M.D., of Heath End, Blackheath, aged 51.
EWART.—On August 1st, suddenly, at Eastney, Devonshire-place, Eastbourne, John Henry Ewart, M.R.C.S., L.R.C.P., aged 73.
MUNRO.—On July 18th, at Elmbank, Largs, Robert Munro, M.D., LL.D., in his 85th year.
NEEDHAM.—On August 2nd, at Clapham Park, Joseph Needham, M.B., C.M Aberd., of Harley-street and Clapham Park, S.W.
VICKERS.—On August 1st, at Roseneath, Paignton, Charles William Vickers, M.R.C.S., L.R.C.P., D.P.H., in his 73rd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Communications, Letters, &c., to the Editor have been received from—

A.—Aberdeen, Medical Officer of Health of.
B.—Mr. J. Brittle, Derby; Dr. J. L. Brownlie, Manchester; Sir J. Barr, Liverpool; Capt. G. H. Barry, R.A.M.C., Alexandria; Col. R. J. Blackham, Bearsted; Dr. A. E. Boycott, Radlett.
C.—Cunard Steamship Co., Liverpool; Children's Country Holidays Fund, Lond.; Dr. C. Coombs, Bristol; Prof. A. R. Cushny, Edinburgh; Dr. P. J. Cammidge, Lond.
D.—Dr. J. S. Dunn, Swanage.
E.—Mr. J. Everidge, Lond.; Dr. A. Erdös, Oradea Mare.
F.—Dr. Z. P. Fernandez, Leeds.
G.—Mr. H. Gardner, Lond.; Dr. A. W. Green, Lond.; Mr. C. D'O. Grange, Harrogate.
H.—Dr. E. Holland, Lond.; Dr. E. Houdart, Bel-Air; Dr. A. F. Hurst, Lond.; Dr. N. Hodgson, Newcastle-on-Tyne.
J.—*Journal of the American Medical Association*, Chicago.
K.—Dr. C. B. Ker, Edinburgh; Prof. A. F. S. Kent, Manchester; Mr. G. Keynes, Lond.; King's College Hospital Medical School, Lond., Sec. of.
L.—London and Counties Medical Protection Society, General Sec. of; Miss G. M. E. Leigh, Birmingham; Dr. A. Loxton, Minehead.
M.—Dr. S. R. Macphail, Derby; Ministry of Health, Lond.; Dr. J. N. Matthews, Glossop; Dr. J. B. McDougall, Wakefield; Dr. T. H. Morse, Deal; Mount Vernon Hospital for Consumption, Lond.; Metropolitan Hospital Sunday Fund, Lond.; Metropolitan Asylums Board, Lond.; Medico-Psychological Association of Great Britain and Ireland, General Sec. of.
N.—National Baby Week Council, Lond.; Dr. F. M. Neild, Crowborough; National Hospital for the Paralysed and Epileptic, Lond.; National Society for the Prevention of Cruelty to Children, Lond.
P.—Dr. K. B. Pinson, Chorlton-on-Medlock.
R.—Dr. J. D. Rolleston, Lond.; Royal Mail Steam Packet Co., Lond.; Royal Faculty of Physicians and Surgeons, Glagow.
S.—Dr. C. Sauvineau, Paris; Dr. J. Sinclair, Lond.; Société des Sciences Médicales et Biologiques de Montpellier.
T.—Dr. F. H. Teale, Paikstone.
U.—*Unity*, Lond., Editor of.
W.—Dr. H. Whitby, Colchester; White Star Line, Southampton, Local Manager of; West London Hospital Post-Graduate College, Sec. of; Dr. H. M. Woodcock, Walton-on-Thames; Mr. R. O. Ward, Lond.
Y.—Dr. R. A. Young, Lond.

Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

THE LANCET: SUBSCRIPTION RATES.

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	Three Months	0 12 6

Subscriptions may commence at any time, and are payable in advance. Cheques and P.O.'s (crossed "London County Westminster and Parr's Bank, Covent Garden Branch") should be made payable to Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C. 2

His Majesty the King has been graciously pleased to become the Patron of The People's League of Health.

Notes, Short Comments, and Answers to Correspondents.

THE ART OF HEALING.[1]

By PROFESSOR ARTHUR KEITH, M.D.

YOU have done me an honour by inviting me to come and speak to you, one which I should little deserve unless I can say something which will serve to quicken your interest in your daily work. Your business in life, as it is also mine, is to help in healing those who have been maimed by injury or disabled by the results of disease. If you were to say that I have no claim to be called a healer for the reason that I never see cases of sickness or attend upon them as physician or surgeon, I would reply that every man who teaches, and particularly any man who discovers, facts relating to the working of the human body is a healer, for we cannot hope to make a machine work rightly unless we know the nature and action of its parts. In this sense even an anatomist is a healer. In your case there can be no question; every day you have to apply treatment to men, women, or children for the relief of stiffness, paralysis, pain, or weakness, or one or other of the many disablements to which the human body is so liable. You are healers, there can be no question of that. But whether it be a case of sprained ankle to which you are called upon to apply your art, or one of broken wrist, or to a man suffering from sciatica, a woman from rheumatic changes in the joints, a child suffering from the late effects of pleurisy, or a middle-aged spinster in the dire throes of facial neuralgia, your interest in your cases, your final success in dealing with them, and the ultimate health of your patient will depend upon your knowledge not of your own particular art, but of how far you have grasped the principles which underlie the Art of Healing. You will understand, then, why I have chosen this as a subject on which to address you, but you will also observe that in giving your secretary a title for my address I was careful to say nothing about principles, because when a Scotchman threatens to speak about principles everybody finds they have urgent business elsewhere. But having got you here I am to take a mean advantage and thrust my principles on you—the principles or laws on which the Art of Healing is based.

Decayed Teeth do not Heal.

There are no parts of the body which can better help us to understand the true nature of the art of healing than those structures with which we have been familiar from infancy upwards—our teeth. That most prevalent of all diseases, caries of the teeth, we all have had experience of at first hand. One morning we are surprised to find—or, if we are in the happier position of being able to afford regular visits to a dentist, our dentist is surprised to find—a hole or ulcer eating into a tooth without our being aware of the fact, there having been not the slightest warning or pain. Pain comes when the pulp cavity is reached—pain and plenty of it; but that is too late for Nature to step in and give us a preventive warning. If a sore or ulcer had formed on the cheek we should have been instantly aware of our danger and have been able to take measures for treatment. We should also know that, in most cases of ulcer or sore, repair will set in and heal the breach. But a hole or ulcer in a tooth will not heal, try how we will; it has no power of repair. The best a dentist can do for us is to clear out the dead tissue, introduce a stopping, and thus avert the disease. The most skilled dentist in the world cannot heal a tooth, cannot make the wall of the cavity produce fresh dentine and new enamel and thus restore the breach; his failure is not his fault, but that of Nature, because she has not given our teeth, for a reason I will explain presently, that virtue or healing power which she has most bountifully bestowed on all the other structures and tissues of our bodies. You will see the point I am trying to score—viz., that if Nature had not endowed our bodies with the power to heal, neither the surgeon, physician, nor masseuse could have done anything whatsoever for the cure of injury or of disease. They could have done no more—perhaps not so much—than the dentist can do for our teeth. They could only have stitched tears of the skin or stopped holes in the flesh. Conceive our condition if such had been the case: the hundreds of men who had broken bones in the accidents of civil life would be walking the streets in splints for the rest of their lives; every one of us would be covered with stitched cuts—often in want of renewal—or with holes which constantly wanted re-stopping, or with ulcers ever weeping, or bruises unchangeably coloured as the rainbow. A modern city would be a warren of surgical out-patients, had Nature not endowed the rest of the body better than the teeth. Think of the condition of our soldiers at the end of a war if their bodies had forgotten how to heal! If we remember these things you will see that when we claim a cure we should not forget how much of our success we owe to the bounties of Dame Nature.

Healing Depends on Cells.

Why has Nature been so culpably negligent as to leave our teeth healingless? It is worth some trouble to look into this matter if only to learn how remarkably prudent she has been on our behalf in all her works. If our teeth had been provided with nerves as freely as our skin; then we should have had warning of the first onset of caries, and could have taken steps to remove the disease at its beginning. But then, what about cracking nuts and chewing roots and tough meat, as primitive man had to do? Eating would have been too painful a process to be indulged in. Nature did her best to secure attention to the teeth by awarding the most excruciating of pains to those who do neglect their teeth. Under the circumstances which conditioned her handiwork she could do no more. But lack of nerves does not explain why teeth have no power to heal, although I think that those parts of the body which are most liberally supplied with nerves of common sensation have a better power of healing than those which have a poor supply. The chief reason was that the substance of the teeth had to be made so hard and resistant that it was impossible to introduce into the enamel or dentine those soft living units which we speak of as cells. It is in these living cells that the power to heal lies; enamel cannot mend a breach in itself because it has got no cells; bone can, because everywhere it provides minute but comfortable nests or residences for the numerous living units scattered through its substance. If we would understand the art of healing, then we must know something of the living units in which the power to heal resides.

We must not think that every cell in the human body can play a part in the act of healing. A nerve cell, and it is also so with a cartilage cell, cannot even mend its own body, much less take a part in the healing of a breach or wound; if injured they die. The epithelial cells which cover the skin can, as you know, multiply, spread, and thus cover over any superficial breach of the body. The epithelium which lines the stomach, bowel, windpipe, and other canals and passages of the body have also this power. But the cells which have been furnished with the greatest degree of healing power are those of the white connective tissues—the tissues which bind the skin down to the underlying parts and which join together the various parts of the body. Let us suppose a muscle has been ruptured or torn, such as the biceps of the arm. Blood oozes into and fills the tear or breach in the muscle. Immediately messages go out, of kinds we do not yet know, and summon from the rest of the body millions of white blood corpuscles to the site of the injury—the workmen who have to clear away the débris caused by the accident. What interests us most, however, is the behaviour of the connective tissue cells lying in the walls of the breach. Up to the time of the accident they have been leading placid, passive lives, binding loosely together the fibres of the muscle without in any way interfering with their contractile duties. In ordinary circumstances they would have gone on performing this quiet duty all their days, just as their forefathers had done for endless generations before them. With the accident their disposition and mode of life change radically and suddenly. They take on, as it were, a fury of action, change their shape, begin to divide and breed, giving rise to broods of builders which are to mend the gap in the muscle. These builders are not poured out as an undisciplined mob; they proceed as orderly marshalled armies. As quickly as they grow out to fill the gap from the sides of the wound they are accompanied by sprouts from the neighbouring capillary vessels and are thus furnished with the means of sustenance. When the débris in the wound has been cleared away and the gap thus filled with a new army of connective tissue units, the units or soldiers begin to change from an active to a passive state; they shrink and form a cicatrix—a mere connective tissue cement. In this way Nature stitches the torn ends of the muscle together. We admit that the surgeon may expose the torn ends of the muscles, clear away the blood and damaged fragments, and stitch the torn ends together, but even when this is done Nature has still her operation to perform, for the only stitches which ultimately hold are those inserted by those extraordinary cobblers—the connective-tissue cells. What rouses these armies of menders to action we do not know. The power to heal is one of the marvels with which living tissues have been endowed. Unless it were so the surgeon would necessarily be a mere cobbler. All we do know is that these living units can do their work unaided by any

[1] Inaugural address at Summer Meeting of Incorporated Society of Trained Masseuses, June 29th, 1920.

human agency, but we also know we can hinder them as well as help them. Long ago Ambrose Paré put the matter in a nutshell when he said: "I dressed the wound; God healed it."

How to Aid the Cells Rightly.

The art of healing lies, then, not in knowing how we can heal the human body, but in knowing how we can help the living units of the body to perform this task for us. We have to study and know the habits and proclivities of these microscopic healing units of the body just as closely and well as we watch and note the ways and weaknesses of our best friends. We cannot watch those indispensable healing assistants too closely. John Hunter knew that. Every time he uncovered a wound and saw the red granulation tissue building up the gap in the flesh he studied it as a gardener does his most precious bud. He saw that the healing tissue must have quiet and comfort in which to do its work. Think for half a minute what progress you would make in mending a rent in your skirt if some restless terrier kept tugging at the hem. Your stitches would be ripped out almost as soon as you had tightened them. Think, then, of the uphill task that confronts the armies of cells which are trying to make good a tear or rupture in a muscle, if that muscle continues to be thrown into action. Nature has foreseen their difficulties and throws the muscle out of action. Hunter observed that if a muscle or tendon was ruptured the patient ceased to have the power to call it into action. At a later stage action and massage may become necessary, but of that we shall speak later on. It was long after Hunter's time that Pasteur and Lister discovered micro-organisms to be the chief enemies of the healing units. If such enemies can be excluded from the body the armies of healing tissue can proceed quietly about their work of mending; if they are not protected from these invaders they have to fight as well as build. It is like reaping a field of corn with most of the reapers serving as policemen. In this way surgeons greatly improved the art of healing by discovering simply why in some cases the real healers of the body were hindered in their work. Then other discoveries led on to further improvements in the art. It is a discovery of ancient times that the human body, after an attack of small-pox, was immune henceforth from this disease. Jenner found out that he could produce an immunity by vaccinating the body with the lymph of cow-pox. Then later we came to understand that the body of anyone attacked by a contagious or infectious disease was the scene of a widespread and terrific battle between invading hosts of micro-organisms and defensive mobile armies represented by the white corpuscles of the blood. At first the physician could do little more than look on and pray for the defenders to have the best of the fight, but by patient and continued observation he is learning how to strengthen the defenders by the use of vaccines, anti-toxins, and other methods of our modern serumtherapy. Here, again, the medical man is not really the healer; that power is inherent in the patient's blood and body; all he can do is to supply such conditions as are within his reach which will give victory to the defensive armies of the body. The best a physician can do is only to hold the lamp while Nature does the mending. But if he knows how to hold it rightly he may well make all the difference in the ultimate result, the difference between recovery and health.

We are but Nature's Assistants.

You will see that the conception I am thrusting home to you is that the power to heal or to regain health lies not in our hands or heads, but in the living flesh and blood of our patients' bodies. The most skilled of us—be we physicians, surgeons, obstetricians, or masseuses—are but Nature's assistants; she does the work, we only have to know how to wait upon her; to wait upon her judiciously is to practise the art of healing in its highest form. This, however, is not the opinion formed of us by the general public nor even by the educated public. Medical men, I fear, have occasionally conveyed the impression that they can heal or cure; one may hear the shallower man declare that he can cure this disease and that; that he saved this woman and rescued that child from death. As a matter of fact, he may have been an essential circumstance in the recovery, but if he is a wise man he claims no more; unless Nature had played her part he would have done his in vain. The impression has laid hold of the public that we can cure, and hence we are tempted to play the part assigned to us. The quack has seized upon this delusion of the public and fools it to the height of its bent by promising in the most unqualified terms to give an assured cure in exchange for a definite payment. They promise cures for cancer! Now that is one of the diseases which even Nature cannot remedy or cure, except on rare occasions. We do not know why she succeeds in these rare cases. Hence, ultimately, even cancer-curers have to own up that their nostrums are useless, because Nature does not support them. But in the great majority of diseases and disorders Nature herself is busy all the time trying to get a cure; in these cases the quack has his opportunity and you may be sure he shares neither the profits nor the credit with Nature. Nature is also working for the physician, surgeon, and masseuse, and they, being conscious of that fact, try to discern not how far they cured the disease but how far the measures they have taken or the movements they have applied have really assisted Nature in securing a restoration to health. If you look at your daily work in this way every case becomes of interest to you. You must ask yourself—and only experience can teach you this—"if I do nothing to this case what will happen—how many days will Nature take to effect a cure; if I aid her in this way or in that by how many days shall I shorten her labour?" All the time you must remember that there is in your patient's body a mechanism of recovery, and whatever action you take or make must be such as helps that mechanism. The key to the art of healing is a knowledge of the reparative mechanisms of the body. That is why you must know the anatomy and physiology of every part, for how can you hope to restore action to muscles and joints unless you know how these act in health?

Rational Basis of Healing.

If in any way I were to undermine your confidence, if I were, in ever so slight a degree, to make you sceptical of the treatment you apply, I should do you an ill-service. Of the exact manner in which the patient's brain and his central nervous system can influence the tissues of his body and the healing power which is inherent in these tissues, we are largely ignorant at present. But we do know that it is an influence which can work on the reparative powers of the tissues—an influence which can work for good or for ill. We are all aware of that. Quacks ply their trade, trusting by a show of confidence to call that power into operation in their own favour. Christian Scientists, with more faith than knowledge, also rely on it and use it. With a backing from the natural powers of the flesh to heal, and the response with which the nervous system reacts to an implicit confidence, a faith-healer may pursue his or her way for a period with some appearance of success. But even in the short run Nature shows up their ignorance and the grossness of their pretence. It is otherwise with those who found the practice of their art on a rational basis. If you know how the movements you apply to your patients, be they passive or active, friction or stroking, effleurage or petrissage, are assisting the natural powers of the body to effect a cure, then you bring to bear on your patient not only the confidence of the faith-healer and the audacity of the quack, but the continued assurance which only rational knowledge can beget in a healer. You have, then, nothing to hide, nothing to explain away, and nothing to fear; all is as fair as the face of truth itself. The one condition is that there must be knowledge—knowledge of the powers of reparation inherent in bodies of man and beast alike.

EGYPTIAN VITAL STATISTICS, 1918.[1]

EGYPT had a population estimated (on the basis of the 1917 Census) at 12,907,870 on July 1st, 1918, as compared with 12,760,229 in 1917. The birth-rate for the whole country was 39·0 per 1000, as compared with 40·3 in the previous year, and the death-rate was 39·7, compared with 29·5. The chief cities, Cairo and Alexandria, the Suez Canal (including Port Said and Ismailia), Damietta and Suez, form so many Governorates, this term being also applied to the sparsely populated Eastern and Western Deserts, the Oases, and the province or district of Sinai. The rest of the country is divided into Mudiriyehs (or provinces), of which there are six in Lower and eight in Upper Egypt. The birth-rate for the whole country was, as just mentioned, 39·0 per 1000. In Cairo, with a population of 763,320, the ratio was 36·7, compared with 41·3 in 1917; and in Alexandria, with 447,441 inhabitants, 36·5, compared with 40·2 in 1917. But in each of these large cities there was considerable variation, the Cairo births ranging from 27·0 per 1000 in the Esbekiya district and 29·1 in Helwân to 44·8 in Bulaq and 46·3 in Old Cairo; the proportion of births being, of course, in inverse ratio with the pecuniary prosperity (or social position) of the residents. Similarly, in Alexandria, the birth-rate varied between 24·7 in El Attarin and 43·7 in Mina al Basal. The town of Ismailia, situated on Lake Timsah, halfway between Port Said and Suez, with a population of 11,408, had the extraordinary birth-rate of 104·1 per 1000, an increase on that for 1917, which was 83·6. The death-rate was even more extraordinary, 738·6 per 1000 (compared with 130·4 in 1917): 7932 out of the total 8426 deaths were males. No explanation is given of this extreme fertility and fatality: presumably there was a large floating population in addition to those enumerated or estimated. For Egypt as a whole the death-rate was 39·7 per 1000, an immense increase on the ratio for 1917, which had been 29·5:

[1] Annual Return of Births, Deaths, and Infectious Diseases registered in Egypt during the Year 1918. Cairo: Government Press. 1920.

in the Mudiriyehs, or provincial Egypt, the ratios varied between 25·7 in Aswân and 41·9 in El Qalyubiya and in El Faiyum. In the Governorates, Cairo had a death-rate of 50·4 (compared with 35·8 in 1917), Alexandria had 43·3 (compared with 31·8), the Oases 80·8 (compared with 41·0), the province of Sinai 782·2 (compared with 56·3). Ismailia has been already referred to. Of the total death-rate (51·01 per 1000), more than one-third is due to three diseases. Gastro-enteritis of children caused 19,201 deaths, equivalent to 10·08 per 1000 (of the whole population); this prevailed throughout the year, was worst in June, July, and August (7517 deaths), and comparatively slight in January, February, and March (1585 deaths). Bronchitis, acute or chronic, caused 10,051 deaths (5·28 per 1000), of which 3454 occurred in November and December. Pneumonia and pleurisy caused 6256 deaths (3·21 per 1000), of which 3265 occurred in November and December. Probably deficient or unsuitable clothing was largely responsible for the prevalence in each of these three diseases. Happily there were only 23 deaths from hydrophobia; these were distributed throughout the year, except that there were no deaths in October and December; 12 occurred in July, August, and September.

THE ROYAL SURGICAL AID SOCIETY.

THIS Society, which was established in 1862, has done a large amount of good work in supplying poor persons with surgical appliances, thus rendering them more efficient members of the community, and in many cases helping the bread-winner to keep the family from being a burden on the State. It is now making an appeal for much-needed funds. To assist in this appeal a collecting-box in the form of a builder's brick, a specimen of which has been sent to us, is being sent out, and an attractive poster in connexion with it carries the message: "Be a brick and help build up the deformed, stricken, and maimed." The idea is an excellent one, for it forcibly reminds the giver that by subscribing to the Society, which is entirely undenominational, he is helping to reconstruct damaged elements of the industrial structure. The work of the Society is truly national and begins where that of the hospital leaves off. Some 500 appliances are supplied weekly. The appeal offices are at 26, Great Ormond-street, W.C.1, and the headquarters at Salisbury-square, E.C.

A FOOT ARCH SUPPORT.

WE have received from Messrs. Salmon Ody, Ltd., of New Oxford-street, London, W.C., an ingeniously constructed "arch support" for use in flat-foot and other cases where the instep requires support. Beneath a leather sock, shaped to the under part of the foot, is affixed a small mattress-like series of springs, the tension on which is modified according to need by turning a small screw-threaded rod. The apparatus is light and resilient in use.

CHILDREN'S COUNTRY HOLIDAYS FUND.

To the Editor of THE LANCET.

SIR,—It has been the practice of the Chairman of the London County Council at this period of the year to issue an appeal on behalf of the Children's Country Holidays Fund. For many years, by means of this Fund, a large number of the children attending the London elementary schools have been enabled to obtain a fortnight's holiday in the country, which has proved of substantial advantage to them from every point of view. This year the Fund has to face a considerable additional expenditure owing to the rise in prices. The charge for a child's board in the country has increased from 9*s*. to 12*s*. a week, whilst, owing to the difficulty of finding sufficient accommodation as a result of the housing problem, a few camps for elder boys are being organised, which will entail further expenditure. At the same time, unfortunately, subscriptions are considerably lower than last year.

May I appeal to all those who are shortly taking a holiday to remember the excellent work of this Fund in order that no children may fail to secure their holiday. Donations should be made payable to the Children's Country Holidays Fund, and should be sent direct to the Secretary at No. 18, Buckingham-street, W.C. 2.

I am, Sir, yours faithfully,
JOHN W. GILBERT,
July 30th, 1920. Chairman of the London County Council.

NECESSITOUS LADIES' HOLIDAY AND GENERAL FUND.

To the Editor of THE LANCET.

SIR,—In your kindness you have allowed me to appeal for years past for contributions towards the Necessitous Ladies' Holiday and General Fund, and I venture once again to ask the charity of your readers; for whose generosity in the past I could never be grateful enough. The poor ladies, unlike their sisters of the rougher classes, are suffering pitifully through the difficulty of obtaining work. I refer to superannuated hospital nurses, governesses, literary ladies, musicians, painters, actresses and companions, many of whom, disqualified by age or infirmity to get engagements, are left behind in the city in the summer months exposed to the privations attendant on poverty.

The Fund also supplies food, medicine, and clothing, and comforts that are even more urgently needed than rest or change of air. Faced with the high cost of living on their tiny incomes, many are in daily anxiety.

I plead, then, for the old, the sick, and helpless. All contributions sent to the following address will be gratefully acknowledged and distributed.

I am, Sir, yours faithfully,
CONSTANCE BEERBOHM (Miss),
48, Upper Berkeley-street, London, W. 1, Treasurer.
August 3rd, 1920.

CHALYBEATE PUNCH: A QUAINT NORFOLK CUSTOM.

CHALYBEATE waters are unlikely ingredients for a bowl of punch, yet this is one of the principal features of a banquet recently revived by a West Norfolk Society known as the "Sons of Reffley." Reffley spring is about two miles from King's Lynn, in the midst of charming woodlands, and from it flows a chalybeate water reputed to possess medicinal qualities. It is strongly impregnated with iron, is of the consistency of ink, and in its raw state is not very pleasing to the taste. The society known as the "Sons of Reffley" is 200 years old, and at present contains about 30 members, who are called Knights of the Temple, their rites being performed in a quaint little temple close to the spring. At the annual banquet of the members, recently held for the first time since the war, the toasts were drunk in the famous "Reffley punch," a wonderful concoction of spirits and the chalybeate waters from this spring. This punch is prepared from an ancient recipe, the secret of which is known only to the successive presidents of the society, and the brew is prepared by the acting president in the morning before the members appear on the scene, and is imbibed from several quaint vessels of considerable intrinsic value belonging to the society. Each newly elected member has to drink a full mug of liquid from the spring, after which he is presented with a long churchwarden pipe. The present President of the "Sons of Reffley" is Sir Everard ffolkes, on whose property the spring is situated.

AN INDIAN MEMORIAL AT BRIGHTON.

THE Brighton Town Council on July 29th accepted the offer, made through Sir James R. Dunlop Smith, of a permanent memorial to commemorate the use of the Royal Pavilion as a hospital for Indian troops. It will take the form of a gateway at the southern entrance to the Pavilion, designed by Mr. Thomas Tyrwhitt, and intended to harmonise with the Oriental character of the buildings on the Pavilion estate. The money is provided by a number of Indian princes and gentlemen in recognition of the generous hospitality and attentions shown to their wounded compatriots by the people of Brighton. Sir Walter Lawrence, Sir John Otter, and Sir J. R. D. Smith were appointed, in conjunction with a local committee in Brighton, to decide on the form which the memorial should take.

PUFFS FROM PATIENTS.

LETTERS of thanks, real or fictitious, are part of the recognised outfit of the vendor of patent medicines. The regular practitioner of medicine has long ceased to make use of them in this country. In South Africa the practice seems still to persist. The following letter appeared in a recent issue of the *Natal Witness*:

SIR,—I am instructed by this branch of the British Medical Association to invite your attention to the fact that notices frequently appear in your valuable paper in which medical practitioners are thanked for services which they have rendered to patients. The Association desires that it should be known that the occurrence of the names of medical practitioners in such notices is not approved by it, and feels assured, when this is publicly known, that the practice will cease.

I am, Sir, yours faithfully,
(Signed) ALEXANDER EDINGTON,
Maritzburg. Hon. Secretary.

To this letter an editorial foot-note was added:—

We insert the above with pleasure. The Medical Association recognises, of course, that it is not possible for the press to actually refuse acceptance of such notices, but we have before endeavoured, at the request of the Association, to discourage a practice which is offensive to the majority of medical men.

Veritas.—As our correspondent continues to withhold his name and address we cannot reply to his questions, some of which merit attention. Incidentally he seems to mistake the scope of a medical journal, and to be entirely ignorant of the functions of the General Medical Council, where his previous anonymous communication was submitted.

The Croonian Lectures

ON THE

PSYCHOLOGY OF THE SPECIAL SENSES AND THEIR FUNCTIONAL DISORDERS.

Delivered before the Royal College of Physicians of London, June, 1920,

By ARTHUR F. HURST, M.A., M.D. Oxon., F.R.C.P.,
PHYSICIAN AND NEUROLOGIST TO GUY'S HOSPITAL.

LECTURE IV.*—SEEING, LOOKING, AND HYSTERICAL BLINDNESS.

Mr. President and Gentlemen,—In the last lecture the psychology of hearing was discussed. It was shown how in order to hear it was necessary to listen, and that the process of listening involved some change at each synapsis in the auditory tract from the cochlea to the cerebral cortex, as a result of which resistance to auditory impulses was diminished.

In order to see it is necessary to look. Looking involves a process in the visual tracts strictly comparable to what occurs in the auditory tracts in listening. But in addition to this the action of a number of muscles is called into play, comparable to what I described in regard to listening, although the movements involved are more important and require much more delicate adjustment. Two distinct elements thus require consideration—the afferent, involving the visual tracts, and the efferent, involving certain motor tracts.

(a) *The Afferent Element.*

Inattention is rarely so profound in normal individuals that no visual impulses reach the brain at all, although complete absence of hearing not infrequently results from extreme inattention. It is common enough for visual impulses to be so blurred that a man, wrapped up in his own thoughts, does not see the approach of a friend, but he would always avoid obstacles if he were walking, and he would be aroused by the sudden approach of an object to his eyes; the latter would also give rise to the flinch reflex.

In the condition of stupor, which was not uncommon in soldiers who had been exposed to exceptionally terrifying ordeals, the mind appeared to be so completely absorbed with thoughts which had no connexion with the patient's present surroundings that he did not respond to any impulses from the outside world. He appeared to be blind, deaf, and anæsthetic; he gave no flinch (visual motor) or jump (auditory motor) reflex; cutaneous (tactile motor) reflexes were often, though not invariably, abolished; and the pupil contracted sluggishly or not at all on exposure to light. In spite of this he could feed himself if food was put in front of him, he did not stumble against obstructions if he were taken for a walk, and he occasionally showed a slight response to certain loud sounds, so that vision and hearing were clearly still possible, but it was difficult or impossible to induce the patient to look or listen even for a few seconds at a time. Exactly the same thing occurs in somnambulism. The doctor, seeing Lady Macbeth walking in her sleep, exclaimed, "You see, her eyes are open," and the gentleman replies, "Ay, but their sense is shut."

In the lecture on "Hearing, Listening, and Hysterical Deafness" it was explained how the idea of being unable to hear, suggested by temporary organic deafness, might give rise to a continued absence of listening and consequent deafness after the organic cause had disappeared. In the same way any condition which has led to complete though temporary blindness may suggest to the individual that he has lost his sight for ever; this is particularly likely to be the case if the temporary blindness is produced suddenly under terrifying conditions, as, for example, by the explosion of a powerful shell in the immediate neighbourhood. The slower onset of the temporary blindness in gassing, although the surrounding conditions might be equally terrifying, generally resulted in less profound hysterical blindness. When the suggestion that the sight is permanently lost has become thoroughly accepted the individual will cease to look. The visual tract is no longer prepared for sight by attention, and visual impulses consequently cease to pass up to the brain. In the act of looking the resistance at each cell-station in the tract is diminished by some such process as a throwing out of dendrites or an alteration in the electro-chemical condition of the synapses. Consequently visual impulses not only give rise to no visual perception, but the flinch reflex and in the most severe cases even the pupil reflex to light disappear, as the resistance to the impulse even at the lowest synapses is too great to be overcome. More commonly the impulses produced by a very bright light can still break through the resistance, so that a sluggish reflex to light is obtainable, but the flinch reflex is still completely abolished.

When, as a result of psychotherapy, the patient realises that he can really see if he only chooses to look, he once more throws out the dendrites (or otherwise reduces the resistance) in the visual path and vision returns, the pupil and flinch reflexes becoming normal again at the same moment.

Injury or disease of the visual centre in the occipital cortex is the only organic condition leading to blindness in which the lower visual centres are unaffected. It might be expected that the flinch reflex would remain unaltered, corresponding with the persistence of the auditory motor reflex in decerebrate animals. This is not, however, the case, as Gordon Holmes,[1] in his unique experience of head injuries during the war, found that the flinch reflex was always lost in the blind fields of vision. This corresponds with the experimental observations of Sherrington, who found that the reflex was always abolished in decerebrate animals, even when the anterior corpora quadrigemina remained intact, although the auditory motor jump reflex remained unaffected. It is not at first clear why the latter should persist while the flinch reflex should disappear. But Sherrington points out that it is not every sound which can produce the auditory motor reflex in cerebrate animals, but that shrill peculiar sounds are the provocative ones, mere loudness appearing to be of no importance. As the effective sounds are neither injurious nor painful, they must have some other meaning, possibly connected with the sexual life of the animal. On the other hand, the retinal stimulus which gives rise to the flinch reflex may perhaps require remembered experience in order to be effective. Thus the reaction of blinking is anticipatory, the response being to threatened injury and not to actual injury. As memory and anticipation depend upon higher centres than the corpora quadrigemina and geniculata, the reflexes are abolished, both in animals and man, when the cortical centres are thrown out of action. The flinch reflex is thus a true visual reflex, being dependent, as von Monakow was the first to show, on visual perceptions.

It is clear from what has been said that in the absence of abnormality in the eyes there is no means of determining with certainty whether absolute blindness in the whole fields or in homonymous areas is organic or hysterical, as the flinch reflex is lost in both.

(b) *The Efferent Element.*

With the afferent element set in readiness visual impulses reach the occipital lobes, but nothing is seen clearly until the eyes are opened; the extrinsic muscles work in thorough coördination, so that the object to be looked at is brought into the centre of the field of vision of both eyes, and the ciliary muscles contract just sufficiently to bring it into correct focus. All these motor processes may be impaired as a result of suggestion, either alone or in addition to the afferent element already described. How this occurs can best be understood by a consideration of the hysterical disorders of vision which follow gassing.

Exposure to mustard-gas is followed in a few hours by pain in the eyes, which is increased by exposure to light. Conjunctivitis, blepharitis, and in rare cases keratitis, quickly develop. As long as pain and photophobia are present, the swollen lids remain closed. This is partly due to inactivity of the levator palpebræ superioris muscles, for the patient makes no effort to open his eyes, knowing that if he were to do so the exposure to light would cause pain. It is partly due to a protective reflex, which results in over-action of the orbicularis palpebrarum muscles, particularly if the patient does try to open his eyes. The object of this is to protect the eyes from being irritated by light; it is accompanied by reflex lacrymation, as a result of which irritating material is washed away. The inflammation gradually subsides, the reflex blepharospasm and lacrymation disappearing pari passu. At the same time the majority of patients realise that they can now open their eyes without hurting them, and in most cases they do so.

In individuals, however, who have become abnormally suggestible as a result of the stress and strain of active service, and in others who for any reason are particularly anxious about the condition of their eyes, the normal results of the conjunctivitis become perpetuated by auto-suggestion, to which may sometimes be added the hetero-suggestion

* Lectures I., II., and III. were published in The Lancet of July 24th (p. 169) and 31st (p. 235), and August 7th (p. 285), respectively.

caused by injudicious treatment, such as the prolonged use of eye-shades and dark glasses, which give rise to an exaggerated fear in the patient's mind of the consequences of having been gassed. The voluntary inactivity of the levator palpebræ superioris becomes perpetuated as an involuntary inactivity, which may amount to actual paralysis, the condition being now one of hysterical ptosis. In rare cases the hysterical paralysis of the levator palpebræ may spread, hysterical paralysis of the whole of the face resulting (Case 8). A patient who finds himself unable to open his eyes by contracting his levator palpebræ muscles often attempts to compensate for this by contracting his frontalis muscles, and if the attempt meets with sufficient success to enable him to see through the chinks between his eyelids, he does this more or less constantly. The reflex blepharospasm is perpetuated as hysterical blepharospasm, which is generally most obvious when the patient attempts to open his eyes voluntarily, the eyes becoming more tightly closed than ever. The paralysis of the levator is thus accompanied by spasm of the orbicularis, just as hysterical paralysis of one group of muscles in a limb is often accompanied by hysterical spasm of the opposing group of muscles. The spasm often involves the neighbouring muscles or even all the muscles supplied by the facial nerve. Any attempt to pull the eyes open meets with great resistance, and a peculiar thrill is often felt owing to the irregular contraction of the orbicularis muscle. In some cases after it has become possible to open the eyes voluntarily the ptosis and blepharospasm manifest themselves intermittently in the form of attacks of blinking, especially on exposure to a bright light. Although hysterical ptosis and hysterical blepharospasm are generally present together, either may be present alone, and the proportion of one to the other may be different in the two eyes, as in Case 8.

In total blindness due to severe bilateral optic atrophy the eyes are kept open during the day and look straight forward, but they close during sleep. An uneducated man, however, if told to pretend that he is blind, generally closes his eyes, and when they are forced open or he is told to open them he at once turns them upwards in order to keep the pupils covered by the lids. Conversely, if he is for any reason unable to open his eyes he will very likely imagine that he is blind. Hysterical ptosis and blepharospasm are thus often accompanied by hysterical amblyopia, the patient having so convinced himself that he cannot see that he makes no attempt to look when his eyes are at last opened. When the lids are forced apart the eyes generally turn involuntarily upwards to protect them from the light. The pupils are consequently still hidden and vision is impossible. Even when the lids are sufficiently separated to expose the pupils the patient can only see indistinctly, and in rare cases he cannot see at all. The indistinct vision is due to a combination of hysterical paresis and spasm of accommodation. A man with normal vision relaxes his ciliary muscles to look at the distance and contracts them to look at a near object. A man who is convinced that he cannot see fails to regulate the activity of his ciliary muscles correctly when he opens his eyes. Instead of relaxing them when he wishes to look at a distant object he throws them into spasm, and he also fails to see near objects clearly, as he does not contract them to the correct extent. He has, in fact, lost control over accommodation, and, believing himself blind, looks at nothing.

The external ocular muscles may remain inactive as hysterical external ophthalmoplegia—a very rare condition, which I have, however, seen occasionally—or, much more frequently, certain muscles may be thrown into spasm in the attempt to bring them into action after long disuse, and hysterical strabismus results. Thus hysterical spasm of convergence is often seen when the eyelids are forced open, in addition to the contraction of the superior recti, which tends to keep the pupils hidden under the upper lids. In consequence of this abnormality of accommodation and convergence the patient sees nothing clearly, but he is not completely blind. Complete hysterical blindness, which is rare in cases of this kind, is due to the patient being so convinced that he cannot see that he does not use his visual centres at all; the psychology of this condition has already been described.

ILLUSTRATIVE CASES.

The following cases of hysterical disorders of vision have been selected from the large number I have seen as illustrating what I have already said concerning their pathogenesis. They also throw light on several questions connected with the ocular movements and reflexes, which have been the subject of controversy in the past. For the description of the majority of cases I am indebted to the medical officers who worked with me at the Seale Hayne Hospital, especially Captain A. Wilson Gill, Captain C. H. Ripman and Captain R. G. Gordon.

In the first case the blindness was the most nearly absolute I have seen result from hysteria. It is of exceptional interest, as it is also the only case in which the reflex contraction of the pupils to light was abolished. So far as I am aware no similar case has hitherto been described.

CASE 1. *Total blindness with loss of pupil reflexes following shell concussion; hysterical nature proved by rapid cure by psychotherapy after persisting for four years.*—Pnr., aged 41, went to France in September, 1914. After six weeks' fighting he was stunned as the result of the explosion of a shell in his immediate vicinity. In the evening he noticed he could not see clearly and attributed this to the shock of the explosion. He at once feared he would lose his sight; his eyelids began to droop and he had difficulty in focussing near objects. He was sent to England where the use of eye drops and dark glasses confirmed his fears, and in a short time he became totally blind. Early in 1915 he was discharged as permanently unfit, receiving a full pension for total blindness. He was examined every six months after this, but no treatment was given. In November, 1918, he was seen by Mr. J. R. Rolston, of Plymouth, who recognised the condition as hysterical and advised his transfer to Seale Hayne Hospital, where he was admitted on Nov. 13th, 1918. He presented the picture of the typical blind beggar of the street. Unshaven, unkempt, and dirty, and wearing a pair of dark glasses, he came supported by his wife, while in his hand he carried a thick stick to help him guide himself. Whilst wearing the glasses he kept his eyes open, but could see nothing; when they were removed he was unable to raise the lids owing to severe blepharospasm, except in a darkened room.

Treatment was commenced the same evening, and in a short time the blepharospasm was overcome and the patient opened his eyes, but he was still totally blind. The pupils were then found to be widely dilated, with no trace of reaction to light. The flinch reflex was completely absent in both eyes. Ophthalmoscopic examination showed nothing abnormal, and a definite diagnosis of hysterical blindness was made. Explanation as to the nature of his condition and encouragement to use his eyes rapidly led to partial restoration of vision, but at the end of two hours he still stumbled over objects placed in his path. After a rest of an hour treatment was continued and further slight improvement occurred. In attempting to focus his eyes he made strong contractions of the muscles of the neck similar to those seen in the spastic variety of hysterical aphonia when the patient attempts to speak.

The next morning he was taken out of doors, and distant objects were soon recognised. An endeavour was then made to teach him to focus his eyes on nearer objects, and by the evening he could read 6/24 at 20 feet. The excessive contractions of the neck muscles continued, however, but by encouraging him to relax they gradually disappeared and vision steadily improved. He was still inclined to stumble over objects placed in his path, but this was merely due to inattention. On Nov. 25th he could read with each eye in turn 6/12 at 20 feet and could spell words printed in small type, but as he was almost completely illiterate he could not pronounce them. The flinch reflex and the normal pupillary reactions to light had returned the first evening.

The patient was also completely deaf in the left ear on admission; he was given instruction in listening, and at the end of a week he could hear normally. When seen four months later, in February, 1919, he was at work as a watchmaker and gramophone repairer.

Whilst a man is still dazed as a result of being blown up by a high-explosive shell he pays no attention to any external stimuli, and may be regarded as psychically blind, deaf, and anæsthetic. His sight, hearing, and cutaneous sensibility generally return as he regains consciousness, but if there is anything which draws his attention to his eyes the blindness may persist as a result of auto-suggestion. The following is one of seven cases seen with Major A. W. Ormond,[4] in which sand was blown into the men's eyes from the sand-bags of the parapet on which the shell exploded. The irritation it caused drew their attention to their eyes and resulted in blepharospasm and amblyopia, which persisted long after every sign of conjunctivitis had disappeared. These early cases were the only ones in which hypnotism was used.

CASE 2. *Hysterical blindness following exposure to a shell explosion cured by hypnotism.*—The patient, aged 22, was looking over a parapet at Gallipoli on July 18th, 1915, when a shell struck the sand-bags in front of him. He remembers the sand being thrown up into his eyes, after which he fell back and knocked his head. He was unconscious for 24 hours. His first impression on regaining consciousness was extreme irritation in his eyes. He tried to open them, but found he could not do so. His mind thus became concentrated on his eyes, and owing to the confusion which is common among the uneducated between inability to open the eyes and blindness, he became absorbed with the idea that he was blind and that he would never be able to open his eyes or see again. The impairment of other functions, which was doubtless present at first, remained unnoticed in this greater trouble, except for some loss of hearing, which quickly disappeared. The condition of his eyes had not altered when I first saw him on Sept. 17th, 1915. He was quite blind, and there was a constant flicker of his eyelids, which were kept almost closed. On forcibly opening his eyes they were found to be turned so far upwards that it was difficult to see even the iris. A few fragments of sand were still embedded in the conjunctiva but not in the cornea; there was no inflammation. The inability to open the eyes and the idea of blindness were thus perpetuated by auto-suggestion, and persisted long after the inflammation caused by the dust had disappeared.

The patient was easily hypnotised, and whilst asleep he was told that he would be able to see when he woke up. The moment he awoke the suggestion was repeated very forcibly, and his eyes were held open. He cried out that he could see, tears ran down his cheeks, and he fell on his knees in gratitude, as he had thought that he was permanently blind, and believed that his sight had been restored by a miracle. When seen again on Sept. 20th the external appearance of his eyes was normal, and he said that he was able to see as well as he had ever done. There was some opacity of the vitreous of the left eye, which was doubtless a result of injury at the time of the explosion. There had been no return of symptoms, and the patient was well in every way when I last saw him on Sept. 30th. His vision was 6/6 in the right eye and 6/36 in the left.

In the next case the blindness was so typical of what would be expected to follow a wound in the occipital region that no doubt was felt as to its organic nature. The sequel, however, proved that it was due to the perpetuation by auto-suggestion of the organic blindness, which had been caused by concussion rather than destruction of the visual centres in the occipital cortex. The patient realising that he was blind in certain directions ceased to look in these directions: the dendrites were perhaps retracted at the synapses in the affected tracts and the flinch reflex consequently disappeared. When at last the œdema and other changes produced by the initial concussion of the occipital cortex had disappeared and vision was again possible, the patient had become so accustomed not to look in the blind fields that no spontaneous improvement occurred.

CASE 3. *Hysterical blindness in three quadrants of the visual field, following organic blindness caused by a wound in the occipital region and associated with hysterical deafness.*—Pte. W., aged 22, was wounded over the lower part of the right occipital region near the middle line on June 7th, 1917. He was unconscious for five days and was then trephined. On admission to Netley, on July 6th, 1917, he was completely deaf in both ears, but as the vestibular reactions on rotation were normal the deafness was regarded as hysterical. It was noticed that he had difficulty in seeing and that he held anything he wished to read low down on the right side, although he volunteered no complaint about this, and only spoke about his deafness. On further examination it was found that he was totally blind except in the right lower quadrant of the field of vision of both eyes, the blindness being what might be expected to result from the wound which had probably involved the whole of the visual centre on the right side, but only the lower part of the calcarine cortex on the left. An attempt was made at the end of August to cure the hysterical deafness by a pseudo-operation, the patient being told that a cut behind his ear would certainly restore his hearing. Nothing was said to him about his blindness, which was regarded as organic. The "operation" resulted in immediate improvement in his hearing, as it at once became possible to carry on a conversation with him by shouting. Quite unexpectedly it was found that his vision was now absolutely normal, the blindness having been cured by the suggestive effect of the "operation."

I shall now describe the different varieties of hysterical visual disturbances, which were such a frequent result of gassing. The first case is an example of the common form in which both eyes were equally affected; the patient was unable to open his eyes owing to a combination of hysterical ptosis and blepharospasm, and when the eyes were opened he only saw very indistinctly.

CASE 4.—*Hysterical blepharospasm, ptosis, and amblyopia of four months' duration.*—Gnr. K., aged 33, had been in France seven months, and for most of the time was on duty behind the firing line, because his nerves were not equal to life at the front. In December, 1917, he was blown up, and was then very shaky and frightened. He was gassed on April 9th, 1918. Next morning he was unable to open his eyes. When admitted to Seale Hayne Hospital, under Captain C. H. Ripman, in August, 1918, he could only see indistinctly through the narrow slit which he could produce by a great effort between his eyelids by strong contraction of his frontalis muscles, and he used his hands to steer himself. A thrill caused by contraction of the orbicularis muscles was distinctly felt in the lids when an attempt was made to force them open.

The orbicularis spasm relaxed and he recovered the power of his levator palpebræ muscles in five minutes as a result of persuasion, and he was then quickly trained to see perfectly well. For a time he was inclined to blink and to let the upper eyelids droop a little; this was due to persistence of slight ptosis, caused by hysterical paresis of the levator palpebræ muscles, and not to spasm of the orbicularis, and in order to counteract the ptosis he continued to wrinkle his forehead. He made a slow but steady recovery from this habit, and was discharged from hospital completely cured a few weeks later.

In Cases 5 and 6 one eye was more severely affected than the other. There must always be some explanation for an asymmetrical condition resulting from a cause which would be expected to act symmetrically. In hysteria the explanation is always a psychical one. In the cases in which visual symptoms were more marked in one eye than the other after gassing it was found that the patient had for some reason been anxious about the vision of the former, which may, in fact, have been less acute than the other on account of an error of refraction.

CASE 5. *Hysterical ptosis with unilateral blepharospasm and amblyopia cured in an hour.*—Cpl. B. was gassed in France in June, 1918. This resulted in severe conjunctivitis. As he could not open his eyes he was afraid he might go blind. He was particularly anxious about his left eye, as it had always been weak and subject to inflammation and styes. In order to protect the eyes when painful he had kept the lids closed, and when the inflammation had subsided he found he was unable to open them. If the left lid was raised he experienced great discomfort and everything seemed blurred. The right eye was not painful and he could see clearly with it, but in order to do so he had to raise the lid by contracting the frontalis muscle, as he could not use his levator palpebræ. He was admitted to Seale Hayne Hospital under Captain R. G. Gordon on Oct. 23rd, and an hour's persuasion was sufficient to induce him to use the proper muscles and to relax the spasm of the right frontalis, but the spasm tended to relapse for a few days unless he paid special attention to it. The vision of the left eye quickly returned with re-education of accommodation.

Cases of Ptosis.

The next case is of interest in connexion with the part taken by the frontalis muscle in ptosis. It is generally taught that hysterical ptosis can be distinguished from ptosis due to organic disease by the fact that the latter is accompanied by compensatory overaction of the frontalis muscle in the effort to keep the eye open, whereas this never occurs in the former condition. Thus Purves Stewart[5] and Oppenheim[6] make the distinction without mentioning the possibility of exceptions. In the following case, however (and also in Cases 5, 7, and 8), there was as marked compensatory overaction of the frontalis as occurs in any case of organic paralysis. The complete recovery after a few minutes' treatment by psychotherapy, although the ptosis had persisted without alteration for a considerable time, confirmed the diagnosis of hysteria. It is not surprising that the belief that compensatory action of the frontalis only occurs in organic ptosis should prove erroneous, as it would seem very natural that a man who was unable to open his eyes by contracting the levator palpebræ superioris should attempt to do so with his frontalis muscle, and it is obvious that in organic ptosis the overaction of the frontalis is purely voluntary. As the exact manner in which hysterical ptosis manifests itself depends simply on the patient's own conception of a drooping eyelid, it would be astonishing if the frontalis did not always contract, and in all the cases of pure hysterical ptosis which I have examined the frontalis did, in fact, contract. It is clear, therefore, that the supposed distinction between organic and hysterical ptosis, which has been copied from one book to another, cannot be regarded as of any value in diagnosis.

CASE 6. *Hysterical blepharospasm, ptosis associated with overaction of the frontalis, and amblyopia following gassing and cured by psychotherapy.*—Corporal H., aged 22, was gassed on May 20th, 1918. He was admitted to hospital the same day with conjunctivitis, his eyes being tightly closed. Thirteen days later he was able to open his left eye, but the right one still remained closed, and he thought he was blind in that eye. Early in June he was transferred to a military hospital in England, where he remained for a fortnight. He was then sent to a V.A.D. hospital and treated with electricity and daily eye-baths with no improvement. He was admitted to Seal Hayne Hospital on Oct. 22nd, under Captain S. H. Wilkinson, with the right eye tightly closed owing to unopposed spasm of the orbicularis, but the left eye was kept partially open as a result of continuous contraction of the frontalis muscle. Vision was so indistinct that he could only see with difficulty, and he was quite unable to read. No conjunctivitis was present, but at the corner of the right eye there was a scar on the skin about the size of a two-shilling piece; this was caused by a nævus having been burnt off when he was a child. He had always believed that this had impaired the sight of the right eye. After being in France for a few months he noticed that the sight of the right eye was becoming more "blurred," and when he was gassed he was at once terrified that he would be completely blinded in this eye. He was treated by persuasion, and in half an hour the orbicularis spasm of the right side and the ptosis of the left were overcome, and he was then quickly trained to focus his eyes, so that his vision became quite normal except for some myopia of the right eye, which had always been present and was doubtless the real cause of this eye being the weaker one.

In the following case the ptosis which was present on one side spread so as to produce complete facial paralysis, which was remarkable in that the only unparalysed muscle was the frontalis, which attempted to counteract the paralysis of the levator palpebræ superioris. The platysma was also involved contrary to what would be expected from Babinski's teaching, he regarded paralysis of this muscle in facial paralysis

as a definite sign that the condition is organic. This is not, however, the only case I have seen in which Babinski's platysma sign has proved to be misleading. Whilst the ptosis spread to produce facial paralysis, the blepharospasm of the affected side spread to produce facial spasm.

CASE 7. *Hysterical left facial paralysis and ptosis, right facial spasm, paralysis of right arm and both legs, aphonia, dysarthria, and amblyopia following gassing.*—Lieut. B., aged 28, was gassed on April 24th, 1918. He remained quite blind and very hoarse for about six days. When sent to England on May 3rd he could see a little and could talk fairly well. On reaching the hospital, however, he could hardly open his eyes and was very breathless. The base of the right lung was dull and crepitations were present; his sputum was blood-stained. He improved, but the left side of his face and his right arm and leg became paralysed during the next few days. He gradually lost the power of speech; he could not phonate at all and could only make unintelligible, whispering sounds. He was unable to open his mouth, and could thus only take fluid food. A few days later the left leg became swollen and a tender spot developed over the femoral vein, apparenlly due to thrombosis; the other leg soon became affected in the same way to a less extent, but rapid improvement occurred, so that the last trace of swelling had disappeared by June 10th.

When I first saw him on June 16th his eyes were closed and there was a constant spasm of the whole of the right side of the face, especially involving the orbicularis palpebrarum and levator anguli oris. The left side of the face, including the platysma, was completely paralysed except for the frontalis, which contracted with excessive vigour in the patient's efforts to overcome the ptosis, which was present on both sides in addition to the spasm on the right side, and this prevented him from seeing unless he held his left eye open. When the upper lid was held open and the right lids pulled apart it was found that there was a marked squint due to spasm of the internal recti. The masseters were tightly contracted, so that he could not open his mouth. Spasm was also present in the left side of the tongue, so that when later he was able to open his mouth and put out his tongue it went to the left. The right arm and leg were completely paralysed, and he was only able to move the left leg with difficulty. With simple persuasion and re-education in breathing he quickly learnt to phonate, and then gradually learnt to articulate clearly. The ptosis of the left eye was overcome by persuasion without difficulty. The spasm of the muscles of the right side of the face slowly improved with massage and stretching the muscles by pulling the eyelids apart and pulling down the upper lip, which was gripped with one finger inside the mouth and the other outside. When at last he was able to open the right eye it was found that he could hardly see with it, but with simple explanation and persuasion the amblyopia disappeared. The severe internal strabismus, which was present when both eyes were open, gradually disappeared as he became accustomed to using his eyes. With some difficulty he was taught to balance himself while standing, after which he quickly learnt to walk. He was treated at intervals from 10 A.M. until 6.30 P.M., by which time he could walk normally. His right arm had now recovered without special treatment, and for the first time since the onset of symptoms he was able to write. He could talk with a normal voice, but in a somewhat laboured manner. The paralysis of the left side of the face and the ptosis had completely disappeared, but there was still some slight spasm of the right side, although he could now open the eye and see quite clearly, and there was no squint.

It is difficult to account for the extraordinary variety of hysterical symptoms which developed in this officer, but from his history it is apparent that whilst some were produced by auto-suggestion others probably developed as a result of unconscious suggestion on the part of those who examined him. He must have been constitutionally suggestible, and the stress and strain of active service, and particularly a heavy bombardment with gas shells every night before he was finally gassed, must have rendered him still more suggestible. As was so often the case in the war, most of the hysterical symptoms developed gradually during the stages of his journey to the base and thence to England, whilst some only appeared after his arrival at an English hospital. The reflex protective aphonia which resulted from the irritating action of the gas on his throat was perpetuated by auto-suggestion. The pulmonary thrombosis, which appears to have developed on his way to England, led to further respiratory symptoms, which were exaggerated and perpetuated by auto-suggestion, so that to the original aphonia was added a severe dysarthria. Frequent examinations of his nervous system must have unconsciously given rise to the idea in his mind of the paralyses and spasms affecting various parts of his body, and the original protective closure of his eyes was perpetuated as blepharospasm on the right side and ptosis on the left, the former spreading so as to involve the whole of the side of the face and the latter becoming complicated by left-sided facial paralysis. The closure of the eyes led by auto-suggestion to the idea of blindness.

Apart from an attack of phlebitis, he remained fit except for a periodic left-sided headache, which made him wonder whether he was not still suffering from organic brain disease, until February, 1920, when he intervened in a domestic dispute between his sister and her husband, immediately after which several of his original symptoms recurred. He was readmitted into hospital under Captain Wilkinson on April 21st, 1920, with blepharospasm of the right eye, flaccid paralysis of the right arm, spastic paralysis of the right leg, and great difficulty in articulation. It was explained to him that owing to the doubt in his mind as to the continued existence of brain disease because of the pain in the left side of his head, and knowing, as he did, that the left side controlled the right side of the body, his mind was just waiting for an excuse to produce the old symptoms again, and this excuse was afforded by the excitement of his intervention in the family squabble. Explanation was followed by persuasion and re-education, and in the course of an hour all the symptoms had disappeared.

Hysterical Blindness in a One-eyed Man.

In the following case hysterical blindness occurred in a one-eyed man. The exciting cause would probably have been insufficient to have affected him had he not been living in perpetual fear that something might deprive him of the sight of his remaining eye.

CASE 8. *Partial hysterical blindness following shell concussion in a one-eyed man.*—Sapper C., aged 28, lost his left eye in 1914 as the result of a shot-gun accident. When he enlisted in 1917 the vision of his right eye was 6/6. He went to France in May, 1918, to work on the railway. In June, 1918, an aeroplane dropped a bomb about 25 yards away, but did not hit him. The force of the explosion, however, was sufficient to dislodge his glass eye from its socket, and simultaneously his right eye became completely blind. The total blindness only lasted for a few days, but very defective vision persisted. He also noticed that erect objects such as telegraph poles appeared to be distorted. He passed through several hospitals where the hysterical nature of the condition was recognised; he was still uncured when he was admitted to Seale Hayne Hospital under Captain Gill on Oct. 26th, 1918.

On examination there were no signs of disease in the eye. The pupil was of small size and reacted briskly to light, but on attempting to focus an object he contracted the muscles of his neck, rotating his head to the right side, and alternate slight variations in the size of the pupil were evident. When he tried to read he held the book low down and either to the left or right side. At a distance of two feet from the eye he could see objects distinctly, but anything nearer or beyond this limit was blurred and indefinite. The flinch reflex was completely absent. His mental attitude was one of great anxiety, and he was considerably depressed at the possibility of complete blindness.

He admitted that he went to France in considerable fear lest anything should happen to cause the loss of his one eye. The shock of the bomb explosion was sufficient to drive out his artificial eye, and this immediately suggested to him some damage to the other eye. Treatment directed towards relieving the patient's fears and encouraging him to relax his ciliary muscle was speedily followed by complete recovery with return of the flinch reflex. Inequality of the pull of the ciliary muscle on the lens accounted for the distortion of upright images. On discharge from the hospital some weeks later his vision was 6/6.

In the next case the primary irritation of the eyes was caused by a sandstorm. It is of interest as showing two forms of hysterical blindness in one individual; in the right eye the motor element was alone affected, but in the left eye, which was more severely damaged in the sandstorm, so that the suggestion of blindness must have been stronger in connexion with this eye, severe psychical blindness was present as well. The latter was almost as complete as the blindness of both eyes in Case 1, and corresponding with this the pupil on this side was dilated compared with the other, and only responded very sluggishly to light.

CASE 9.—*Hysterical blindness following sandstorm; 26 months' duration; cured by psychotherapy.*—Pte. F., aged 52, was caught in a sandstorm in December, 1916, without any protection for his eyes. He developed intense conjunctivitis and keratitis with severe pain and photophobia, and was unable to open his eyes. Despite the fact that the inflammation and pain gradually disappeared, he was still unable to open his eyes when he was sent home from Egypt. In March, 1917, no improvement having occurred, he was discharged from the army as permanently unfit with a disability of 100 per cent.

On Feb. 10th, 1919, he was admitted to Seale Hayne Hospital under Captain Gill. He wore a pair of dark glasses, on removal of which he was found to have severe bilateral blepharospasm. With explanation and persuasion the spasm of the orbicularis muscles and the spasm of convergence which was also present were speedily overcome. It was then found that the left eye was completely blind, so that the patient could not distinguish light from darkness, and could face the sun without blinking. The vision of the right eye was very defective, but he could pick out large objects and name some of them correctly. The pupils were unequal in size, the left being slightly the larger. Reaction to light was normal in the right side, but very sluggish in the left. Reaction to accommodation was irregular, but was sometimes brisk in both eyes. The blink reflex was present on the right side, but was completely absent on the left. Ophthalmoscopic examination showed that the

retinæ were normal. There was no conjunctivitis, but slight keratitis was present in both eyes, being most marked in the left. Captain R. Jaques, who examined him for us, reported: "I can find nothing to account for the defect in vision. The corneal nebulæ are not sufficient for this."

Complete recovery followed psychotherapy; the pupils became equal in size and reacted normally, and a brisk flinch reflex was present on both sides. In the case of the right eye all that was required was to teach the man to regulate the action of the ciliary muscle, relaxing it for distant objects and contracting it for near objects. In the case of the left eye it was necessary first of all to convince the man that he would be cured, and then to encourage him to look with it.

There has been much discussion in the past as to whether homonymous hemianopia can ever be hysterical. Several cases, however, have been described. The following case is of interest, as hemianopia of one eye was associated with partial blindness of the whole field of the other eye.

CASE 10.—*Hysterical blindness of one eye and hemianopia of the other cured by psychotherapy.*—Bdr. U., aged 25, developed severe conjunctivitis as the result of a bombardment with mustard-gas shells on March 21st, 1918. After three weeks' treatment he was able to open his eyes, but found that he was almost completely blind in the left eye, being able to see only a white mist, while with the right eye he could see imperfectly. He was admitted to Seale Hayne Hospital under Captain Gill on Nov. 5th, 1918. The eye specialist's report accompanying him stated: "Left eye completely blind, right eye 6/24." On admission there was no conjunctivitis, and no sign of corneal scarring. The pupils were equal in size and reacted sluggishly to light and accommodation. The left eye was completely blind and the flinch reflex was absent. With the right eye he could see distant objects clearly. On attempting to read with the right eye he held the book slightly to the right side, so that the light from the book fell on the nasal half of the right retina, the temporal half of which appeared to be blind. The flinch reflex was abolished except when the direction of the blow was towards the nasal half of the right retina. Peripheral vision as tested with the moving finger was extremely defective in the right eye. Ophthalmoscopic examination showed the presence of a tiny foreign body embedded in the lens of the left eye, but no other organic changes were apparent. As the result of psychotherapy, complete recovery resulted in each eye, both for near and distant objects, and the flinch reflex was completely restored.

The presence of a small foreign body in the left lens, which had apparently been driven in some time before, had given rise to no visual trouble at the time beyond making the patient aware that the vision of the left eye was less good than that of the right. This no doubt accounted for the more complete hysterical loss of vision in this eye after the gassing. Believing that he was completely blind in the left eye, he appears to have subconsciously come to the conclusion that he would necessarily be blind to everything on his left side, and in this way the loss of the nasal half of the field of vision of his right eye was suggested.

The next three cases have no connexion with the war, although two of them occurred in soldiers. For different reasons in each case the patient had unconsciously taught himself to ignore the retinal impressions produced by one eye to such an extent that it had become blind, the condition being exactly analogous to the hysterical blindness already described. In the first case the patient taught himself to see once more with the blind eye when he began to lose the sight of the other as a result of optic atrophy. In the other two cases vision was restored by psychotherapy.

CASE 11. *Hysterical blindness of left eye; recovery of left eye following loss of sight of right eye caused by syphilitic optic atrophy.*—John P., aged 40, received a blow over the left eye in 1915; he could not open it, but on raising the lid he found he was blind. During the next eight months he regained the power of the levator palpebræ superioris, but he could still only see with his right eye. He was able to carry on with his occupation as a brass-worker until August, 1919, when he found that vision with his right eye was becoming blurred by an orange-coloured mist. He now covered his right eye with a shade, and quickly taught himself to see almost perfectly with his left eye, which he had thought was blind. When he came under observation in October, 1919, it was found that the recent loss of vision in his right eye was due to advanced optic atrophy, and the slight deficiency in the left eye was due to slight changes of the same nature. The right pupil reacted to accommodation but not to light, the left pupil responded to both. There were no other physical signs of disease. The Wassermann reaction of both blood and cerebro-spinal fluid was positive, and 54 lymphocytes per c.mm. were found in the latter, together with slight excess of globulin. The optic atrophy was obviously of syphilitic origin, but there were no signs either of general paralysis or tabes. Antisyphilitic treatment was given, but no change in vision resulted.

The blindness of the left eye following the blow was suggested by the pain and bruising which prevented him from raising the lid. Four years later loss of sight in his other eye prompted him to try to see with his left eye, and to his surprise he found he could soon see fairly well. In order to abolish the blurred image produced by the right eye he covered this up. The slight deficiency in vision which persisted in the previously blind eye was not hysterical like the original total blindness, but was caused by a slight degree of optic atrophy.

In the next case the patient had a congenital defect of one eye which led to deficient vision. He had learnt to neglect what he saw with this eye, but still retained some vision in it, when at the age of 15 for no obvious reason he became almost totally blind in it. The blindness was suggested by the defective vision caused by the congenital abnormality and was cured by psychotherapy; it could thus be correctly regarded as hysterical.

CASE 12.—*Combined hysterical and organic blindness in the right eye; hysterical element cured by psychotherapy after four years.*—Pte. M., aged 19, had never seen as clearly with his right eye as with the left. In 1914, while working as a clerk, he noticed that the right eye was becoming blind, and in February, 1918, when he enlisted, he could only just distinguish light from dark with it. Captain Jaques found a persistent hyaloid artery passing from a posterior polar cataract to the optic disc. With very little persuasion he was taught to use the right eye again so well that he could read without difficulty. The pupil reactions were present in each eye, but the flinch reflex was totally abolished until vision was restored, when it became quite normal.

A severe squint dating from childhood in a man of 25 would not at first be regarded as likely to be hysterical. But in the following case not only the squint but also the associated loss of vision in the affected eye appear to have been of this nature. It is well known that when diplopia develops in adults they unconsciously train themselves to ignore one image; the same thing occurs in children who develop a permanent squint. The eye which ceases to be used in this way becomes more or less completely blind. After it has persisted for several years it is generally held that the blindness is permanent, and that while an operation may be performed to bring the eyeball into a central position, yet no improvement in vision is likely to occur. Moreover, in the event of an injury occurring to the sound eye sufficient to cause blindness, the previously squinting eye is generally said to be only capable of recovery if the squint has not been in existence for more than six or seven years.

CASE 13. *Hysterical blindness in a squinting eye; improved by psychotherapy after persisting for 20 years.*—Rifleman B., aged 25, at the age of 6 was frightened by a performing bear, and his mother states that he has squinted inwards with the left eye ever since, although she is confident that there was no squint prior to this event. On admission to Seale Hayne Hospital under Captain Gill on July 19th, 1918, with hysterical paralysis of the right hand, which was cured the following day, the left squinting eye was found to be almost completely blind. There was no paralysis of any of the ocular muscles. Captain Jaques found + 3 diopters of hypermetropia in each eye.

There is no adequate explanation why squinting should result from an error of refraction which is equal in the two eyes. It seemed probable, therefore, that the squint was really a result of the fright caused by the bear. This might have caused a hysterical convulsive seizure, associated with squinting, as is so often the case in the convulsions of children. It was assumed that the squint had become perpetuated as a hysterical symptom, and an attempt was therefore made to treat both the squint and the blindness by psychotherapy. The patient was quickly taught to keep the two eyes nearly parallel. He was then shown how to use his left eye, and at intervals the right eye was kept covered in order that the other should be in constant activity. We did not, however, succeed in curing the squint, although the patient could overcome it whenever he tried, and vision had so far recovered in the blind eye that the patient could read large type.

The disturbances in vision so far described were independent symptoms and filled the whole clinical picture. Hysterical blindness may also occur in one eye associated with paralysis of the same side as in the following case, the graphic description of which we owe to Carré de Montgeron.[7]

Hysterical hemiplegia and hemianæsthesia with total blindness, immobility, anæsthesia, and loss of conjunctival and corneal reflexes of the corresponding eye.—On Dec. 24th, 1717, Marie-Jeanne, the 27-year-old wife of François Stapart, of Epernai, was seized with "apoplexy." After three days of fighting between life and death the attack left her with paralysis and loss of sensation affecting the whole of the left side. "Of all the parts involved in this sad malady," wrote Montgeron, "the eye was the most seriously affected; the roots of the optic nerve of the left side were entirely enveloped in the obstruction of the brain; and as this nerve is the immediate organ of vision, the obstruction which deprived it of all action rendered it absolutely incapable of perceiving light. At the same time the other nerves which serve for the movements and procure the sensibility both of the globe and the eyelids were equally completely obstructed; thus the eye and the lids lost all sensation and remained immobile. ..... The insensibility was so great that one could easily put one's finger between the lids and touch the eyeball without causing any movement or pain." That is to say, she was not only completely blind in the left eye, but the

orbicularis was paralysed, the lids, conjunctiva, and cornea were anæsthetic, and the conjunctival and corneal reflexes were abolished. In the next six months the patient gradually regained the use of her arm and leg, but the condition of the eye had remained unaltered when, nearly ten years later, she had a second attack, which again affected her left side, and from which she again recovered. She was scarcely convalescent when she was struck down a third time, but on this occasion the paralysis of the left side was complete. The arm hung useless by her side, and she could only move with difficulty, dragging her useless left leg behind her. The muscles of the arm and leg became atrophied and the skin œdematous. Being convinced that no human resources could help her, and recalling how she had heard of one, Anne Angier, who had been cured of paralysis, which had affected her for 21 years, as a result of the intercession of M. Rousse, she determined to visit his tomb in the Chapelle de Ste. Anne at Avernai. "She was fortified in this resolution by a dream, which she took for a message from heaven. It seemed to her that she had been transported in the night to the tomb of M. Rousse, and that there the most perfect recovery had suddenly been vouchsafed to her."

On May 16th, 1728, in spite of the opposition of the church authorities because Rousse had not been canonised, she visited his tomb. Here she was suddenly seized with violent pain in her hand and eye. Strength returned to the left hand, so that she could join it with the right in prayer, and to her leg, so that she could kneel. The eye, which had been blind for ten and a half years, recovered its sight, its power of movement, and its sensibility. The recovery from the hemiplegia, hemianæsthesia, and blindness was complete, and there had been no relapse when Carré de Montgeron wrote his "Vérité des Miracles" 19 years later.

NARROW AND SPIRAL FIELDS OF VISION IN HYSTERIA, MALINGERING, AND NEURASTHENIA.

Retraction of the field of vision has been regarded as the most characteristic "stigma" of hysteria since Charcot first drew attention to it in 1872. Janet[8] considered it to be "the emblem of hysterical sensibility in general," and it led him to describe hysteria as a condition due to "retraction of the field of consciousness." Among ophthalmologists de Schweinitz[9]

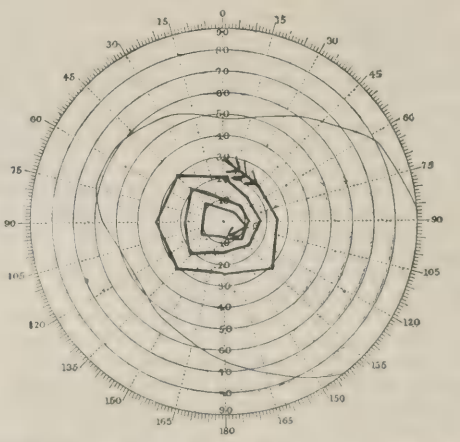

FIG. 8.—Right eye, without-inward spiral field in case of hysterical paraplegia.

regards this sign as "a permanent stigma" of hysteria, and believes its value as an aid to diagnosis to be "exceedingly great." But Babinski[10] found no change in the field of vision in any of a series of a hundred consecutive cases of hysteria, examined in great detail by methods which excluded the possibility of suggestion. Morax,[11] a former assistant of Charcot, from whom he learnt the supposed significance of the retracted field of vision, at first continued to find it in almost every patient suffering from hysterical symptoms. But over 20 years ago he became a convert to Babinski's views, and since then he has not seen a single case of hysterical retraction of the field of vision. As it is almost impossible to avoid suggesting a narrow field of vision with the perimeter in highly suggestible individuals, he estimates the fields with the finger or other familar object in hysterical patients, and although this may appear at first to be less accurate, it has the great advantage of making it easy to avoid suggesting abnormalities in the course of the examination.

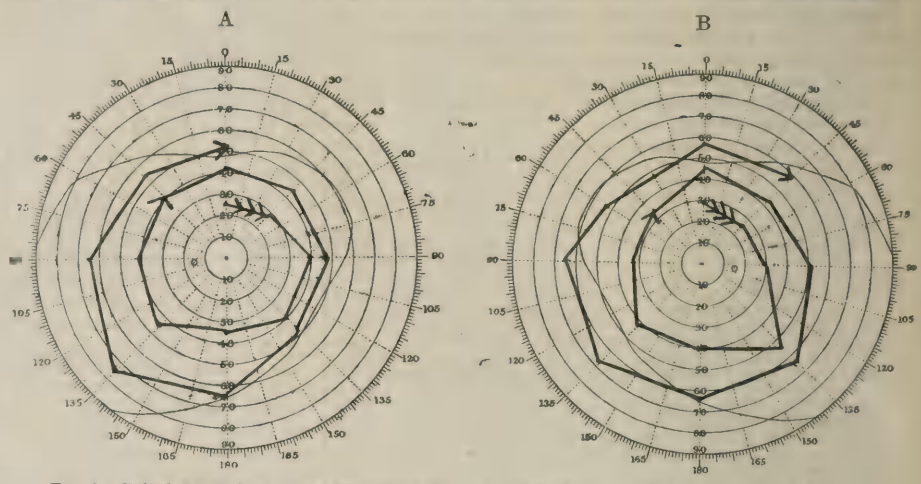

FIG. 9.—Spiral fields in case of hysterical tremor. (A) Left eye, within-outward spiral field. (B) Right eye, within-outward spiral field.

In spite of the comparatively frequent occurrence of the various hysterical disturbances of vision I have already described, I have never seen patients with hysterical symptoms affecting other parts of the body who spontaneously complained of disabilities resulting from a narrow field of vision, however closely they were cross-examined on the subject. But if a narrow field of vision is produced by testing with the perimeter the patient may subsequently complain of considerable inconvenience as a result of the cutting off of his peripheral vision.

In association with Major J. L. M. Symns[12] I examined numerous soldiers suffering from various war neuroses, who were abnormally suggestible as a result of the stress and strain of active service, some, but not all, of whom were suffering from gross hysterical symptoms. We never found any retraction of their field of vision until the perimeter was used. But the perimeter invariably resulted in the suggestion of a narrowed field, however carefully it was used. Moreover, if the examination was continued after the first field was marked out a spiral field was always obtained (Fig. 8) identical with that which has hitherto been regarded as a stigma of hysteria. We believe that the reason why a spiral field of vision, which is the natural result of continued suggestion, has not been found in a larger proportion of hysterical cases showing a narrow field of vision is simply because it has not been looked for, the examiner being content when he has marked the limit of vision a single time in each direction.

It has generally been taught that a spiral field of vision is a result of fatigue, and it has even been stated that it is more frequently a symptom of neurasthenia than of hysteria. We have found that this is not the case, the *inward* spiral, which has hitherto alone been described, being a result of the method employed in using the perimeter. An *outward* spiral is always obtained instead of an inward one if the white disc of the perimeter is moved outwards instead of inwards, as is commonly done. (Fig. 9.) By varying the direction in which the disc was moved we could produce an inward spiral one day and an outward spiral another day with the same eye, or an inward spiral with one eye and an outward spiral with the other at the same time. (Fig. 10.) There is no question of any special suggestions made by us in our method of using the perimeter, as identical results were obtained by other observers, who marked out the fields of vision for us without knowing the nature of the cases or the object we had in view in obtaining the tracings. Moreover, we have always obtained normal fields in normal individuals, whether the disc was moved inwards or outwards.

In the observations on "experimental malingering," which I described in my first lecture, we asked 27 individuals, who were pretending to be paralysed on the right

side, and none of whom had mentioned any disturbance in vision when detailing their symptoms, whether they could see as well with the right eye as the left; seven replied that they had noted some impairment of vision in the right eye. On testing the field of vision with a finger no narrowing was observed, and they explained that the deficiency they had spoken about was a blurring or general loss of clearness of vision. But when tested with a perimeter all of the seven showed a narrow field on the right side, and one had a slighter narrowing on the left side. In the only two cases in which it occurred to us to continue the investigation after the first field had been marked out a spiral was obtained (Fig. 11), which was identical in character with that supposed to be characteristic of hysteria.

Ocular Aura in Hysterical Fits.

I have seen several cases of hysterical attacks which were preceded by a visual aura. Most of the cases in soldiers dated from a period of strenuous activity in the glare of Mesopotamia. In the following case, in which the attacks consisted of headache and loss of consciousness and not of epileptiform convulsions, an understanding of the psychological processes involved resulted in immediate recovery from a very incapacitating condition which had persisted for two years.

Hysterical photophobia with attacks of headaches and loss of consciousness.—Captain S. was wounded in the head in 1915. He was temporarily paralysed on the right side and suffered from violent headaches, which culminated in loss of consciousness. He gradually improved, and no more attacks occurred after the end of 1916. He went back to France in 1917. Soon afterwards he had some acute mental disorder, for which he was in hospital for five months; after this he was invalided out of the service, but was fit enough to be sent to Greece on diplomatic duty. In 1918 he went to Salonica for an operation to be performed on his heel. Some ether appears to have been accidentally dropped into his eyes during the operation,

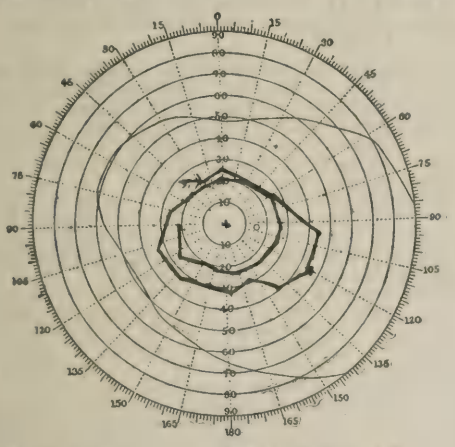

FIG. 11.—Spiral contraction of field of vision in a case of "experimental malingering."

as when he came round from the anæsthetic he found his eyes were so painful that he could not open them, and he thought he had lost his sight. At the end of a month he could see a little, but he could not read and had always to wear the darkest glasses he could get, as directly his eyes were exposed to the daylight he had a violent headache, which was followed in a few minutes by complete loss of consciousness.

I first saw him in February, 1920. It was very difficult to examine his eyes as he kept them tightly closed. When the dark glasses were removed, or even when he was wearing them, he never opened his eyes widely, but he could see enough to get about without assistance. He was very depressed about his condition. His arm and leg were quite well, and there were no physical signs of organic disease. There was a slight depression of the skull in the region of his wound, but it was not tender and there was no bony deficiency.

I explained to the patient that when the removal of the bandages from his eyes for the first time after they had been injured was followed by a headache, he subconsciously associated this with the headaches which had followed the wound to his head, and that he had consequently suggested to himself the same sequel—loss of consciousness. The attacks of headache followed by unconsciousness now became associated in his mind with his eyes instead of with the original injury to his head. Consequently an attack occurred every time he removed his dark glasses, and for this reason he feared to face the light. The blepharospasm and deficient sight were produced in the way I have already described in connexion with the hysterical disorders of vision caused by gassing. Having discussed this explanation with him in great detail I promised him he would recover completely when he came to me for treatment the next day. He arrived fully convinced he

A B

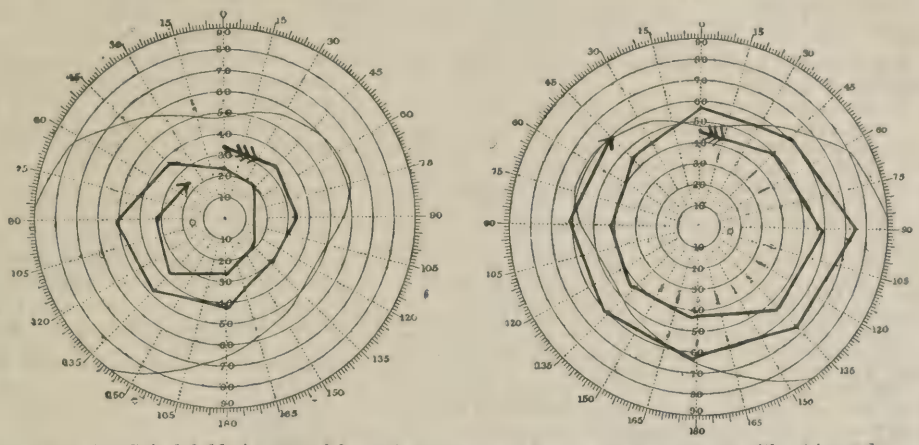

FIG. 10.—Spiral fields in case of hysterical mutism and tremor. (A) Left eye, without-inward spiral field. (B) Right eye, within-outward spiral field.

would be cured, having thoroughly grasped the explanation I had given him of the origin of his symptoms. Without difficulty I persuaded him to remove his dark glasses, keep his eyes widely open, and accommodate his vision for near and distant objects. For the first time for two years he was able to keep his eyes open without getting a headache, and an hour later he went for a walk in the sun without glasses. In the four months which have elapsed he has had no further attacks of headache and loss of consciousness. He has just married and is shortly returning to his diplomatic duties.

I believe that hysterical fits are much more common than is generally supposed, and that many such cases are diagnosed as epilepsy and treated for years with bromides. It has been said that a definite aura is uncommon in hysteria, but common before true epileptic fits. I am convinced that this is incorrect, and that some kind of warning invariably precedes an hysterical attack. It is indeed this "warning," which acts as the suggestion, which is the exciting cause of each fit. A symptom which has once produced an attack will be likely to produce another whenever it recurs, because it subconsciously reminds the patient of his earlier attack and thus suggests that another will occur.

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DONATIONS AND BEQUESTS.—The late Mr. John William Barclay, of Manchester, by his will left £1000 each to the Manchester Royal Infirmary and Dispensary and the Salford Royal Hospital; £500 each to the Ancoats Hospital and Ardwick and Ancoats Dispensary, Manchester Hospital for Consumption, Manchester Royal Eye Hospital, Manchester Children's Hospital, Pendlebury, St. Mary's Hospital, Manchester, and the British Hospital, Buenos Aires.

AN INVESTIGATION INTO THE CAUSAL ORGANISM OF INFLUENZA.

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THE following deals with the investigation of three small epidemics, as well as a few sporadic cases of what clinically appeared to be influenza, in the Shorncliffe area during the months of February, March, and April, 1920.

The object of the investigation was to try to find out the causal organism.

These cases appeared in four definite centres, viz.:—

1. Canterbury.—This was a sudden, though mild, epidemic during the first three weeks of March, 1920. It attacked the 10th Hussars, and infected a large number of them. The majority suffered very slightly, and there were only between 20 and 30 cases admitted to hospital. Here they infected a few more of the hospital patients. Of these 17, who appeared clinically to be suffering from influenza, were investigated.

2. Dover.—This was a similar epidemic to that at Canterbury. It occurred during the first three weeks of April, 1920. It affected both the Royal Irish Fusiliers and the Connaught Rangers. Of the hospital cases I investigated 6.

3. Shorncliffe.—Here the cases were entirely sporadic, and were spread over the months of February, March, and April, 1920. The number investigated was 8.

4. Hythe.—This epidemic was sudden and short-lived. It developed only in the Small Arms School, and appeared to have been brought there by new arrivals from other areas. It occurred during the last two weeks of April, 1920. The number of cases investigated was 9.

Before commencing the study of these cases it might be of interest to draw attention to the enormous fallacies present in the so-called influenza returns. The diagnosis, depending as it does in most cases entirely on clinical evidence alone, naturally tends to great errors. Cases may be labelled under any number of names—e.g., migraine, headache, tonsillitis, bronchitis, laryngitis, rheumatism, &c. The converse also holds good, as a large number of diseases, more especially during and immediately after an influenza epidemic, are conveniently and popularly diagnosed as influenza. This naturally cannot be helped in the present state of our knowledge regarding the disease, but ought to make one very chary in accepting any statistics or statements based on these returns.

(1) CLINICAL SIGNS AND SYMPTOMS.

These coincided in the cases derived from the Canterbury, Dover, and Shorncliffe areas, but were slightly different in those from the Hythe epidemic.

In the Canterbury, Dover, and Shorncliffe areas the cases showed the following characteristics: (1) Sudden onset in all; (2) rise of temperature in all; (3) pulse-rate increased in correspondence with the rise of the temperature (i.e, if the case was not complicated); (4) respiratory rate depended on the amount of lung involvement; (5) headache in 93 per cent.; (6) pains in limbs, back, or chest in 80 per cent.; (7) suffusion and injection of eyes in none = 0 per cent.; (8) coryza in 36 per cent.; (9) bronchitis in 83 per cent.—this usually did not develop until two to four days after the onset of the illness; (10) tonsillitis and pharyngitis in 80 per cent. (marked, often patient's chief complaint); (11) laryngitis (late in development) in 6 per cent.; (12) herpes labialis in 33 per cent.

In this series of cases there was only one death. This occurred from a secondary septic broncho-pneumonia in one of the Dover cases. The complications were as follows:—

Three cases developed broncho-pneumonia, and of these one died.
One case is suspected of having developed tuberculosis of the lungs.
One case developed diphtheria.
" " " dementia præcox.
" " " subacute rheumatism.
" " " furunculosis.
" " " nephritis.

In the Hythe cases the following characteristics were noted: (1) Sudden onset, occasionally with history of a slight rigor; (2) rise in temperature in all; (3) increase in pulse-rate corresponding to the rise in temperature (i.e., if a non-complicated case); (4) respiratory rate depended largely on the lung involvement; (5) headache in 100 per cent; (6) pains in limbs, back, or chest in 77 per cent.; (7) suffusion and injection of the eyes was present in 100 per cent., the facies was characteristic, and the watery, bleary appearance of the eyes reminded one of an early case of measles; (8) coryza in all = 100 per cent.; (9) bronchitis in all = 100 per cent.; (10) tonsillitis and pharyngitis in 44 per cent. (never marked); (11) laryngitis in none = 0 per cent.; (12) herpes labialis in none = 0 per cent.

In the Hythe cases there was one death from septic broncho-pneumonia. This patient showed marked cyanosis, and reminded one of the picturesque description of the laity—viz., "purple or blue influenza."

It will be seen that clinically the cases divide themselves into two classes: (1) Those from the Hythe epidemic showed marked eye symptoms and slight throat involvement. (2) The other cases from the other areas showed by contrast marked throat involvement, but no eye symptoms.

Bacteriologically, the organisms isolated as *B. influenzæ* (Pfeiffer) correspond to the following description:—

In size they were from 1·0μ to 2·0μ in length by about 0·4μ in thickness. They do not occur in chains; but in subcultures, especially if old, filamentous forms sometimes appear. I am inclined to think that the organisms which tend to produce filamentous forms on subculture belong to a definite group of the influenza bacillus, as some varieties, no matter how long subcultured, will never produce filaments.

They stain feebly with basic aniline dyes, and are best stained with either: (*a*) weak solution (1 in 10) of carbol-fuchsin for five to ten minutes, or (*b*) a strong solution of carbol-fuchsin for from one to two minutes. The organism is definitely Gram-negative, non-motile, and non-sporing.

Bacillus influenzæ (Pfeiffer) grows very well on boiled blood agar, feebly on blood-smeared agar, and not at all on subculture on ordinary agar.

The optimum temperature for growth is about 37° C. After 24 hours' growth on boiled blood agar the organisms begin to show a variety in their staining reaction, some bacilli taking the stain strongly, whilst others stain very feebly.

The boiled blood agar medium was eminently satisfactory. It was found that growth was most luxuriant on a slightly moist medium; therefore plates were left only 24 hours in the 37° C. incubator before being inoculated.

The standard of reaction of the agar used was that with a P_H value of 7·4 to 7·8.

In some cases the medium was titrated with equally successful results by the Eyre method. In these cases it was standardised to +10 Eyre scale. Tubes of the agar were melted by boiling in a saucepan, and about 1·0 c.cm. of sterile human blood directly added to each tube. This was well shaken to prevent lumps forming and boiled for from two to three minutes in the saucepan. The medium was then ready for pouring into plates or sloping in large tubes (6″ × 1″). The latter method was most successful, as there was not nearly as much medium wasted by contamination as with plates. The tubes were always used whenever the organism had been isolated in pure culture.

On boiled blood agar, after cultivation for 24 hours at 37° C., the colonies of the influenza bacillus appear as moist, greyish, "filmy" colonies. These vary from the size of a pin's head to colonies with a diameter of 3 mm. The edges are regular and the outline is circular. The larger colonies show a typical umbonate appearance.

When touched with a platinum loop the colonies appear of a slimy character and can be easily emulsified in normal salt solution. As they become older they become drier and more friable.

The method of examining the cases for the presence of *B. influenzæ* was by means of West's post-nasal swabs, as used in cerebro-spinal fever work.

At the commencement of the investigation 200 men were examined to find out the carrier-rate. These were swabbed in three ways—viz.: (*a*) Anterior nasal route; (*b*) post-nasal route; (*c*) ordinary throat swab.

The largest number of positives were obtained by the post-nasal method, the smallest by the anterior nasal method. Thus the post-nasal method was adopted as a routine.

Boiled blood agar plates were immediately inoculated and kept in special carriers at a constant temperature of 37° C. until the laboratory was reached, when they were at once

deposited in the 37° C. incubator, and left there for 24 hours. The plates were then examined and likely colonies picked off. Next day these subcultures were stained by Gram's method, and if satisfactory were subcultured until absolutely pure. During this process an agar plate was always inoculated to see if any growth took place. No organism which on subculture grew on ordinary agar at 37° C. was regarded as *Bacillus influenzæ* (Pfeiffer).

The pure cultures were used for the preparation of various antigens and emulsions. If no influenza bacillus was cultured from the suspected case at the first swabbing this was repeated twice before a negative result was accepted. This definitely increased the number of positives obtained. Thus of 20 positives—

16 were found positive from the first swab = 80 per cent.
3 ,, ,, ,, ,, ,, second ,, = 15 ,,
1 was ,, ,, ,, ,, third ,, = 5 ,,

In the last case the trouble was the presence of a contaminating organism in the throat which rapidly overgrew the whole plate.

The examination of direct films was also tried. This gave an idea of the relative proportion of the *B. influenzæ* to the other organisms in the naso-pharynx. It, however, was found that some cases which were negative for *B. influenzæ*, as examined by the direct film method, were positive on culture.

Results of Swabbing in the Four Centres.

The results of swabbing in the four centres were as follows:—

Canterbury cases.—In all 17 cases were examined, and all were found positive. In 15 absolutely pure subcultures were eventually obtained. In 2 the organism unfortunately died out before a pure culture could be obtained. In these cases the most troublesome contaminating organism was a small hæmolytic streptococcus which appeared to grow in the midst of, as well as around, the influenza colonies.

Dover cases.—These were six in number, and all were found positive. In the case that died a pneumococcus was also isolated. This latter case was difficult to investigate, as far as the throat swabbing was concerned, because of the presence of a rapidly growing large Gram-negative bacillus.

Shorncliffe cases.—Eight cases were examined. Seven were positive and one was persistently negative in spite of frequent examinations. It was diagnosed as due to infection by the *B. influenzæ* on the clinical signs plus the positive agglutination and complement-fixation results. Taking the cases from these three areas, which were 31 in number, one finds that *B. influenzæ* was isolated from the naso-pharynx of 30—i.e., a percentage of 96·8 per cent. positive.

Hythe cases.—The result of the investigation of this epidemic came more or less as an anticlimax to the previous work, as one had begun to expect to find *B. influenzæ* in the large majority of suspected cases. Here nine cases were investigated. *Bacillus influenzæ* was found in only one, and here, I think, not as a causal agent of the disease, but merely as a component of the naso-pharyngeal bacterial flora. The reason for this statement being that this case yielded negative results to both agglutination and complement-fixation tests. Further, as the carrier-rate for *B. influenzæ* in that area at the time of the epidemic was 8 per cent., the presence of one positive throat swab in nine cases was to be expected. Of the other organisms present the only one which was common to all was a Gram-negative diplococcus which showed the following characteristics. It grew well on blood agar at 37° C. In staining by Gram's method it was rather difficult to decolorise in young cultures (up to 24 hours), but was easily decolorised in older cultures. It was very difficult to emulsify in saline. It gave no agglutination with any of the types of meningococcal agglutinating sera. It gave no agglutination with any of the sera obtained from five of the cases. Complement-fixation tests were not tried.

Its cultural characteristics were as follows:—No liquefaction of gelatin (up to ten days) at 20° C.; granular deposit in peptone water, and bouillon; no production of indol; acid in glucose and maltose; no change in dulcite, inulin, lactose, mannite, saccharose, dextrin, galactose, adonite, sorbite, lævulose, raffinose, and arabinose up to ten days. It was non-hæmolytic on blood media. No change was noticed in litmus milk after ten days' incubation at 37° C. In the case that died, besides the above-mentioned coccus, a hæmolytic streptococcus, a pneumococcus, and a staphylococcus were isolated from the naso-pharyngeal swab.

(2) AGGLUTINATION RESULTS.

The agglutination of the isolated organisms by means of the patients' sera was next investigated. The well-known Dreyer's technique was used.

The emulsion was made from a culture which had been subcultured daily for from six to eight times. Enough was made up at once for all purposes, as it was impossible to keep so many subcultures growing at the same time. It was found that heating the emulsion for one hour at 58° C. diminished its agglutinability, and that a slightly more opalescent emulsion than that of the usual standard agglutinable cultures for the typhoid group of organisms gave the best results.

The emulsions were preserved by means of 0·1 per cent. formalin. The agglutination was carried out in an incubator at 55° C. for from 24 to 36 hours, care being taken to keep the atmosphere in the incubator moist. In some few cases an incubation of 36 hours appeared essential to get the best results. As a routine the tubes were examined at the end of 24 hours, and after the results had been noted they were replaced for another 12 hours, and again examined. The type of agglutination varied a great deal, sometimes being of a coarse character with heavy flocculi, whilst in others it was of a fine granular type.

The dilutions used were 1 in 25, 1 in 50, 1 in 150, and 1 in 250.

In all cases a saline control was put up as well as a known positive and known negative.

The following were the emulsions used:—Ha., Ed., Up., Kn., Ke., Bo., St., Cu., Fa., Ta., Dr. Di., Tr., Ha., Bu., Ne., Ca., El., Ke., Pa., An., Se., Ph., Ly., Bo., As., Fo., Mu., Du., 63, 407, 126, 203, 65, 67, 78, 36, 49. The numbered emulsions were obtained from some of the organisms derived from positive carriers of *B. influenzæ*. To simplify the description the results will be put in tabular form.

The 17 cases given in Table I. were those examined from the Canterbury area. The only ones which showed any agglutination were those in which the temperature was still elevated when the blood serum was examined. The others, where the blood was withdrawn during convalescence, showed definite negative results. The possibility of the organisms isolated being poor for agglutination purposes was recognised, and it was proposed to examine any further cases, not only during the time of the fever, but, if possible, again during convalescence. The next series of cases examined were from the Dover area. The tabulated results are as given in Table II.

Table II. hardly needs any explanation. Agglutination appears in all these cases. The results as far as the emulsion of Ly., Fo., and An. are concerned must be disregarded, for, as will be shown later, they gave non-specific agglutination with normal sera. Thus agglutination in the above cases appears to be present early in the disease, and from consideration of the Canterbury series it seems to rapidly disappear immediately the temperature has fallen. Some emulsions, such as those of El., Mu., and Pa. are much more easily agglutinated than the others.

The agglutination results in the Shorncliffe cases (Table III.) corroborate the findings in the Canterbury and Dover cases. In order to clinch the statement that influenza agglutinins rapidly disappear from the blood during convalescence blood was again withdrawn from some cases during convalescence, and compared with the agglutination results obtained from the same blood sera withdrawn during the fever. The results are shown in Table IV. The serum of Mu. was inserted by way of being a control. The temperature was still up when the serum was withdrawn and the case was a pretty severe one. The agglutination titre had risen. In the other cases it is seen that without exception the influenza agglutinins in the blood had rapidly disappeared soon after the temperature had fallen.

The next series of cases to be examined were those from the Hythe epidemic. In only one case—viz., Du.—was the *B. influenzæ* isolated from the throat swab. Blood could only be obtained from five of the cases—viz., Pa., Du., McG., Ea., and Pe. The results are given in Table V. In none of these cases, though the blood was withdrawn at the most favourable time, was there any agglutination with emulsions of known agglutinable strains of *B. influenzæ*.

Controls.—Next all the emulsions which gave positive agglutination results in the above-mentioned cases from all areas were tested with 20 normal sera. The emulsions of Fo., An., and Ly. gave numerous non-specific agglutinations, and are therefore to be disregarded in reading any of the above-mentioned results. The emulsions of Ha., Cu., El., Mu., Ke., Bo., Pa., 126, and 203 gave no agglutination in any dilution of from 1 in 25 to 1 in 250 with the control sera. It is, therefore, concluded that these emulsions are only

TABLE I.

(A) Patient's serum used. (B) Emulsion used. (C) Agglutination titre. (D) Time between onset of illness and withdrawal of blood. (E) Time between last day of fever and withdrawal of blood.

— means no agglutination. † means partial agglutination. †† means total agglutination.

(A)	(B)	(C) 1 in 25	1 in 50	1 in 150	1 in 250	(D)	(E)
1. Kn.	Kn.	—	—	—	—	16 days.	Last day of fever.
	Ha.	†	††	†	—		
	Fa.	—	—	—	—		
	Ke.	—	—	—	—		
2. Ke.	Ke.	—	—	—	—	16 days.	10 days.
	Up.	—	—	—	—		
	Ha.	—	—	—	—		
	Ed.	—	—	—	—		
	63	—	—	—	—		
3. Bo.	Bo.	—	—	—	—	18 days.	11 days.
	Ed.	—	—	—	—		
	407	—	—	—	—		
	126	—	—	—	—		
	203	—	—	—	—		
4. Wh.	203	—	—	—	—	17 days.	11 days.
	Ha.	—	—	—	—		
	St.	—	—	—	—		
	Di.	—	—	—	—		
	407	—	—	—	—		
5. Pe.	63	—	—	—	—	16 days.	10 days.
	65	—	—	—	—		
	Bu.	—	—	—	—		
	Ne.	—	—	—	—		
	Ha.	—	—	—	—		
6. Ta.*	—	—	—	—	—	—	—
7. Cu.	Cu.	—	†	†	—	15 days.	Temp. still up.
	Ke.	—	—	—	—		
	Bu.	—	—	—	—		
	Dr.	—	—	—	—		
	Ed.	—	—	—	—		
8. Fa.	Fa.	—	—	—	—	13 days.	(See below).
	Ed.	—	—	—	—		
	65	—	—	—	—		
	63	—	—	—	—		
	407	—	—	—	—		
9. St.	St.	—	—	—	—	15 days.	3 days.
	Up.	—	—	—	—		
	Ed.	—	—	—	—		
	65	—	—	—	—		
	63	—	—	—	—		
10. Dr.	Ed.	—	—	—	—	11 days.	4 days.
	Dr.	—	—	—	—		
	Up.	—	—	—	—		
	Di.	—	—	—	—		
	Ne.	—	—	—	—		
11. Di.	407	—	—	—	—	15 days.	(See below).
	203	††	—	—	—		
	Di.	—	—	—	—		
	Kn.	—	—	—	—		
	126	††	††	†	—		
12. Tr.	Cu.	—	—	—	—	11 days.	3 days.
	Tr.	—	—	—	—		
	Fa.	—	—	—	—		
	Di.	—	—	—	—		
	St.	—	—	—	—		
13. Ha.	Ha.	—	—	—	—	16 days.	9 days.
	Ed.	—	—	—	—		
	Up.	—	—	—	—		
	Ha.	—	—	—	—		
	Kn.	—	—	—	—		
14. Bu.	Bu.	—	—	—	—	11 days.	5 days.
	Ha.	—	—	—	—		
	203	—	—	—	—		
	407	—	—	—	—		
	126	—	—	—	—		
15. Ne.	Ne.	—	—	—	—	14 days.	[illegible] days.
	St.	—	—	—	—		
	Up.	—	—	—	—		
	Cu.	—	—	—	—		
	Ed.	—	—	—	—		
16. Ca.	Ca.	—	—	—	—	13 days.	2 days.
	St.	—	—	—	—		
	Fa.	—	—	—	—		
	65	—	—	—	—		
	63	—	—	—	—		
17. El.	El.	††	††	††	†	6 days.	Last day of fever.
	Ha.	—	—	—	—		
	Up.	—	—	—	—		
	Kn.	—	—	—	—		
	Ed.	—	—	—	—		

Case 8.—Temperature still up. Temperature rose for second time on the seventh day after having been normal for three days.
Case 11.—Temperature still up. Seventh last day of fever. * Refused to have blood withdrawn.

TABLE II.—*Cases from Dover Area.*

18. Bo.	Bo.	†	††	††	†	(?)*	(See below.)
	El.	†	—	—	—		
	Ed.	—	—	—	—		
	Mu.	—	—	—	†		
	Ke.	—	—	—	—		
	Pa.	—	—	—	—		
19. An.	El.	—	—	—	—	5 days.	Temp. still up.
	Mu.	†	—	—	—		
	Ph.	—	—	—	—		
	Ly.	††	†	—	—		
	An.	†	††	—	—		
20. Ly.	Ly.	††	†	—	—	7 days.	Temp. still up.
	An.	††	†	—	—		
	El.	†	—	—	—		
	Ph.	—	—	—	—		
	Bo.	—	—	—	—		
	Mu.	—	—	—	—		
21. Ph.	Bo.	††	††	††	—	6 days.	,,
	Ph.	†	—	—	—		
	Mu.	—	—	—	—		
	Ke.	††	†	—	—		
	El.	††	††	—	—		
	Up.	—	—	—	—		
22. Se.	Pa.	††	††	††	†	5 days.	1 day.
	Ke.	†	—	—	—		
	El.	††	†	—	—		
	Se.	—	—	—	—		
	As.	—	—	—	—		
	Fo.	††	†	—	—		
	Mu.	††	††	†	—		
23. Mu.	Mu.	††	†	†	†	8 days.	Temp. still up.
	Fo.	††	††	—	—		
	As.	—	—	—	—		
	Se.	—	—	—	—		
	Pa.	††	††	††	†		
	Ke.	†	—	—	—		
	El.	††	†	—	—		

* Patient unconscious. Unable to get reliable history.

Case 18.—Temperature still up. Died four days later.

TABLE III.—*Sporadic Cases from the Shorncliffe Area.*

24. Ke.	El.	††	—	—	—	4 days.	Temp. still up.
	Mu.	—	†	—	—		
	Pa.	††	††	††	†		
	Ke.	†	†	†	—		
	Ha.	—	—	—	—		
	Up.	—	—	—	—		
	Ha.	—	—	—	—		
25. Pa.	Tr.	—	—	—	—	5 days.	Last day of fever.
	Ha.	—	—	—	—		
	Ha.	—	—	—	—		
	Pa.	††	††	—	—		
	Ke.	—	—	—	—		
	El.	††	—	—	—		
	Mu.	—	—	—	—		
	Ph.	—	—	—	—		
26. Ed.	Ha.	—	—	—	—	18 days.	17 days.
	Ed.	—	—	—	—		
	Up.	—	—	—	—		
	63	—	—	—	—		
	67	—	—	—	—		
	78	—	—	—	—		
	126	—	—	—	—		
	65	—	—	—	—		
	203	—	—	—	—		
27. Ha.	Ha.	—	—	—	—	19 days.	12 days.
	Up.	—	—	—	—		
	Ed.	—	—	—	—		
	63	—	—	—	—		
	67	—	—	—	—		
	203	—	—	—	—		
28. Up.	36	—	—	—	—	6 days.	2 days.
	49	—	—	—	—		
	63	—	—	—	—		
	65	—	—	—	—		
	78	—	—	—	—		
	203	—	—	—	—		
	Up.	—	—	—	—		
	Ed.	—	—	—	—		
	Ha.	—	—	—	—		
29. St.*	Ly.	††	†	—	—	3 days.	Temp. still up.
	An.	††	—	—	—		
	Mu.	—	—	—	—		
	Fo.	††	††	—	—		
	El.	††	††	—	—		
	Bo.	—	—	—	—		
	Ke.	—	—	—	—		
	Pa.	—	—	—	—		
30. As.	Se.	—	—	—	—	3 days.	Temp. still up.
	As.	—	—	—	—		
	Fo.	††	†	—	—		
	Mu.	††	††	†	—		
	El.	—	—	—	—		
	Ke.	—	—	—	—		
	Pa.	—	—	—	—		
31. Fo.	El.	—	—	—	—	5 days.	,,
	Ke.	—	—	—	—		
	Pa.	—	††	†	—		
	Mu.	††	††	††	†		
	Fo.	††	†	—	—		
	As.	—	—	—	—		
	Se.	—	—	—	—		

* Throat swab was negative for *B. influenzæ.*

TABLE IV.

As., 1st exam.	Mu.	††	††	†	—	3 days.	Temp. still up.
	El.	—	—	—	—		
	Pa.	—	—	—	—		
As., 2nd exam.	Mu.	—	—	—	—	18 days.	6 days.
	El.	—	—	—	—		
	Pa.	—	—	—	—		
Pa., 1st exam.	Mu.	—	—	—	—	5 days.	Temp. still up.
	El.	††	††	—	—		
	Pa.	††	—	—	—		
Pa., 2nd exam.	Mu.	—	—	—	—	30 days.	24 days.
	El.	—	—	—	—		
	Pa.	—	—	—	—		
Ph., 1st exam.	Ke.	††	†	—	—	6 days.	Temp. still up.
	Ph.	†	—	—	—		
	Bo.	††	††	††	—		
	El.	††	††	—	—		
Ph., 2nd exam.	Ke.	—	—	—	—	23 days.	13 days.
	Ph.	—	—	—	—		
	Bo.	—	—	—	—		
	El.	—	—	—	—		
Ke., 1st exam.	Pa.	††	††	††	†	4 days.	Temp. still up.
	Ke.	†	†	†	—		
	El.	††	—	—	—		
Ke., 2nd exam.	Pa.	—	—	—	—	28 days.	9 days.
	Ke.	—	—	—	—		
	El.	—	—	—	—		
Mu., 1st exam.	Ke.	†	—	—	—	8 days.	Temp. still up.
	El.	††	†	—	—		
	Mu.	††	†	†	†		
Mu., 2nd exam.	Ke.	††	††	—	—	15 days.	,,
	El.	†	††	††	†		
	Mu.	††	††	—	—		

TABLE V.—*Cases from Hythe Area.*

(A) to (E) as in tables on opposite page.

(A)	(B)	(C) 1 in 25	1 in 50	1 in 150	1 in 250	(D)	(E)	(A)	(B)	(C) 1 in 25	1 in 50	1 in 150	1 in 250	(D)	(E)	(A)	(B)	(C) 1 in 25	1 in 50	1 in 150	1 in 250	(D)	(E)
Pa.	Ph.	—	—	—	—	6 days.	2nd last day of fever.	McG.	El.	—	—	—	—	8 days.	Last day of fever.	Pe.	El.	—	—	—	—	6 days.	Last day of fever.
	Ke.	—	—	—	—				Ph.	—	—	—	—				Ph.	—	—	—	—		
	Pa.	—	—	—	—				Ke.	—	—	—	—				Ke.	—	—	—	—		
	Bo.	—	—	—	—				Pa.	—	—	—	—				Pa.	—	—	—	—		
	El.	—	—	—	—				Bo.	—	—	—	—				Bo.	—	—	—	—		
Du.	Du.	—	—	—	—	4 days.	Last day of fever.	Ea.	Ph.	—	—	—	—	6 days.	3rd last day of fever.								
	El.	—	—	—	—				Ke.	—	—	—	—										
	Mu.	—	—	—	—				Bo.	—	—	—	—										
									Pa.	—	—	—	—										
									El.	—	—	—	—										

agglutinated by sera containing specific agglutinins for *B. influenzæ* (Pfeiffer).

Conclusions Derived from the Agglutination Work.

That in those cases derived from the Canterbury, Dover, and Shorncliffe areas, (*a*) specific agglutinins for *B. influenza* (Pfeiffer) appeared early in the disease (in some cases at the third day); (*b*) these agglutinins disappeared rapidly when convalescence set in—i.e., when the temperature had again become normal.

Regarding the *B. influenzæ* from an agglutination point of view: (1) A large number of strains are non-agglutinable when tested with sera derived from cases at all stages of the illness. (2) Some few types are easily agglutinated; they do not appear to be differentiated into any particular definite classes, but it must be remembered that all these cases occurred in one district and were probably all of the same origin. I had not the opportunity of testing the blood sera against strains derived from other remote districts. (3) Some bacilli isolated gave non-specific agglutination—thus the advisability of control sera.

Now, regarding the Hythe epidemic, *B. influenzæ* was isolated from one case only (Du.). In none of the cases was any agglutination obtained with emulsions of *B. influenzæ*. The one case was regarded, as far as the presence of the *B. influenzæ* was concerned, as a carrier of that organism.

A Gram-negative diplococcus was isolated in all the cases, and an emulsion prepared from each. These emulsions were put up with sera from 5 of the cases in dilutions of 1 in 25 to 1 in 250. In no case was there any agglutination. The sera used were from the cases Pa., Du., McG., Ea., Pe. The emulsions used were made from the diplococci isolated from the following cases: Pa., Du., McG., Bl., Ea., Mrs. Ea., Pe., and Mrs. Pe.

The negative agglutination results do not support the view of the diplococcus being the causal organism in this epidemic.

(3) COMPLEMENT FIXATION.

The usual technique was employed. The main details of this were as follows:—

The fixed volume in each tube was always 3 c.cm. The washed sheep's blood corpuscles were used in a 3 per cent. suspension. The hæmolysin was titrated before each experiment to find out its minimum hæmolytic dose (M.H.D.). In the titration of the antigens, as well as in the tests proper, a dose of 2 M.H.D.'s of hæmolysin was used—i.e., the hæmolytic couple consisted of 1 c.cm. of a 3 per cent. suspension of washed sheep's blood corpuscles, in which there was also contained 2 M.H.D.'s of hæmolysin.

The complement was 1 c.cm. of a 1 in 20 dilution of fresh guinea-pig's serum in saline (0·85 per cent.). The remaining 1 c.cm. in the tubes consisted of the varying amounts of antigen, patient's serum, and saline.

The antigens used were three in number. They were polyvalent, and were found to give exactly the same results.

The method of preparation was simple. The various strains were cultivated for 48 hours on boiled blood agar at 37° C., and the resulting growth washed off with saline solution. Care was taken not to include any of the medium. The emulsion was well shaken up in order to make it homogeneous and heated for one hour at 58° C. in the water-bath; 0·5 per cent. carbolic was then added as a preservative.

TABLE VI.

— Means complete hæmolysis.
† ,, nearly complete hæmolysis.
†† ,, moderate hæmolysis.
††† ,, faint hæmolysis.
†††† ,, no hæmolysis.

	Name.	Results and serum used. 0·05 c.cm.	0·1 c.cm.	0·2 c.cm.	Antigens used.	Time between onset of illness and withdrawal of blood.	Time between last day of fever and withdrawal of blood.
Canterbury cases.	1. Kn.	—	—	—	1 & 2.	16 days.	Last day of fever.
	2. Ke.	—	†	†††	1, 2, & 3.	16 ,,	10 days.
	3. Bo.	—	†	†††	1, 2, & 3.	18 ,,	11 ,,
	4. Wh.	—	†	††	1 & 2.	17 ,,	11 ,,
	5. Pe.	—	—	—	1 & 2.	16 ,,	11 ,,
	6. St.	—	—	—	1 & 2.	15 ,,	3 ,,
	7. Cu.	—	†	†	1 & 2.	15 ,,	Temp. still up.
	8. Fa.	—	—	—	1 & 2.	13 ,,	2nd last day of fever.
	9. Ta.*						
	10. Dr.	—	—	—	1, 2, & 3.	11 ,,	4 days.
	11. Di.	—	—	—	1, 2, & 3.	15 ,,	7th last day of fever.
Dover cases.	12. Tr.	—	—	—	1 & 2.	11 ,,	3 days.
	13. Ha.	—	—	†	1 & 2.	16 ,,	9 ,,
	14. Bu.	—	†	††	1 & 2.	11 ,,	5 ,,
	15. Ne.	—	†	††	1 & 2.	14 ,,	[illegible] ,,
	16. Ca.	—	†	††	1 & 2.	13 ,,	2 ,,
	17. El.	—	—	—	1 & 2.	6 ,,	Last day of fever.
	18. Bo.	—	—	†	1, 2, & 3.	? 1st wk.	Temp. still up.
	19. An.	—	—	†	1, 2, & 3.	5 days.	,,
	20. Ly.	—	†	†	1, 2, & 3.	7 ,,	,,
	21. Ph.	††	†††	††††	1, 2, & 3.	6 ,,	,,
	22. Se.	—	—	†	1, 2, & 3.	5 ,,	1 day.
	23. Mu.	—	—	†	1, 2, & 3.	[illegible] ,,	Temp. still up.
Shorncliffe cases.	24. Ke.	—	†	††	1, 2, & 3.	4 ,,	,,
	25. Pa.	—	†	††	1, 2, & 3.	5 ,,	Last day of fever.
	26. Ed.	—	—	—	1 & 2.	18 ,,	17 days.
	27. Ha.	—	—	†	1 & 2.	19 ,,	12 ,,
	28. Up.	—	†	††	1 & 2.	6 ,,	2 ,,
	29. St.	—	—	†	1, 2, & 3.	3 ,,	Temp. still up.
	30. As.	—	†	††	1, 2, & 3.	3 ,,	,,
	31. Fo.	—	†	††	1, 2, & 3.	5 ,,	,,
Hythe cases.	32. Pa.	—	—	—	1, 2, & 3.	6 ,,	2 days.
	33. McG	—	—	—	1, 2, & 3.	8 ,,	Last day of fever.
	34. Du.	—	—	—	1, 2, & 3.	4 ,,	—
	35. Ea.	—	—	—	1, 2, & 3.	6 ,,	3 days.
	36. Pe.	—	—	—	1, 2, & 3.	6 ,,	Last day of fever.

* Refused to have blood withdrawn.

In most of the cases examined all three antigens were used. In no case were ever less than two used. They were composed of organisms isolated from the following cases.

Antigen 1.—Ha., Up., and Ed.

Antigen 2.—Kn., Ke., Bo., St., Cu., Fa., Ta., Dr., Di., Tr., Ha., Bu., Ne., Ca., Ed., Ha., and Up.

Antigen 3.—Fo., As., Mu., Se., An., Ph., Ly., Bo., Pa., El., and Ke.

After the M.H.D. of the hæmolysin had been determined the antigens to be used were titrated to find out their anticomplementary dose. After much work with normal sera and sera from influenza cases it was found that the best dose of antigen to use was one-quarter of the anticomplementary dose. Any higher dose, say ⅓ or ½, of the anticomplementary dose produced an increasing number of false positive reactions amongst the controls. As the amount of fixation of complement was never great, it was essential to use the very utmost of care in the test if a really accurate result was to be obtained.

The patient's serum was used (after inactivation at 55° C. for half an hour) in doses of 0·05 c.cm., 0·1 c.cm., and 0·2 c.cm. A serum control of 0·4 c.cm. was always put up. Fresh sera were used as an old negative sera, though perfectly sterile, occasionally gave positive results.

In the test proper the following tubes were put up:—

Tubes 1, 2, and 3 were concerned with the testing of the varying amounts (0·05 c.cm., 0·1 c.cm., and 0·2 c.cm.) of the unknown serum.

Tube 4 was the serum control (i.e., containing 0·4 c.cm. of patient's serum).

Tube 5 was the antigen control. (Three times the dose of the antigen was used—i.e., three-quarters of the anticomplementary dose).

Tube 6 was the hæmolytic control (i.e., corpuscles + hæmolysin + complement).

Tube 7 was the corpuscle control (i.e., corpuscles + hæmolysin).

Tube 8. A known positive serum.

Tube 9. Serum control of known positive serum.

Tube 10. A known negative serum.

Tube 11. Serum control of known negative serum.

Tube 12. Weak positive serum.

Tube 13. Serum control of weak positive serum.

The latter two tubes I consider most important as they give one a very good idea of the accuracy of the test.

Twenty normal sera were used as controls and all gave negative results except two, viz.:—

(*a*) Faint positive—i.e., — — +. This patient gave a history of influenza a year ago.

(*b*) Moderately strong positive + + ++. This man said he had influenza one month previously.

The control sera were mainly from venereal or suspected venereal cases—e.g., syphilis, gonorrhœa, soft sores, and venereal warts.

The exceptions were as follows: Psoriasis, malaria, tuberculosis, nephritis, and acute otitis media, of each one case.

The results are given in Table VI.

Conclusions.

The results, taken along with the results of the examination of the 20 control sera, are decidedly in favour of the reaction being specific in character.

The cases from the Hythe epidemic—viz., numbers 32, 33, 34, 35, and 36 in the above table—gave negative results. This is another point against *B. influenzæ* being the infective agent in these cases.

Of the other cases which appeared by cultural and agglutination results to be due to *B. influenzæ*, 21 out of 30—i.e., 70 per cent.—gave positive results. It appeared in some cases as early as the third day of the illness.

Of the cases (12) examined during the first week of the illness 91·7 per cent. were positive. Of the cases (7) examined during the second week of the illness 57·1 per cent. were positive. Of the cases (11) examined during the third week of the illness 54·5 per cent. were positive.

This shows that the number of positives is at its greatest during the first week of the illness, rapidly diminishes during the second week, and then slowly continues falling during the third week.

Of the controls, as above mentioned, quite a strong positive was obtained in one man a month after an attack of influenza, and a feeble positive in another case one year after an attack. There appears to be no relationship between the severity of the attack and the amount of complement fixed.

(4) THE MIOSTAGMIN REACTION.

This test is mainly used in the diagnosis of cancer, but has also been used with success in the diagnosis of some bacterial infections—e.g., typhoid, tuberculosis, &c. It was decided to try it in the diagnosis of influenza. As this test is not well known in this country it will perhaps be an advantage to give a more detailed account of the technique than has been given in the case of the agglutination and complement-fixation work.

The reaction is a surface tension phenomenon, the exact mechanism of which is not understood. It depends on the fact, as first noticed by Ascoli, that when an antigen is brought into contact with its corresponding antibody there is a reduction of the surface tension of the fluid containing these. This change is ascertained by means of a dropping pipette of great accuracy. Such an instrument was marketed under the name of a Traube's stalagmometer. I could not obtain the latter instrument, but am indebted to Messrs. Hawksley, London, for the production of a very satisfactory substitute.

A fixed amount, usually 1 c.cm. of the fluid to be tested, is drawn up into the pipette and its drop number ascertained. The antigen is prepared and used in such a dilution that it does not increase the drop number of normal serum beyond one drop for 1 c.cm. The drop number of the stalagmometer I used was just a trifle low (45 per 1 c.cm. of distilled water), but it gave most accurate readings. The stalagmometer was rigidly fixed up in a vertical position (ascertained by use of a plumb line) by means of two burette stands fixed up at right angles to each other and screwed down to a solid bench. The arms of the burette stands grasped the stalagmometer firmly at two points about 2 inches apart, and thus prevented any movement of that instrument in any direction.

A mark was made on the bench where the drop from the stalagmometer should fall, and the apparatus was always tested by this means before use. The maximum error allowed after numerous tests was 0·25 of a drop in 1 c.cm. of distilled water.

All glassware used was scrupulously clean. The tubes were never plugged with cotton-wool as the fibres of the latter interfered with the accuracy of the test. The stalagmometer after use was cleaned out with distilled water, alcohol, and ether. The latter was got rid of by means of a current of hot air.

The most important part of the test was the preparation of a suitable antigen. Three in all were prepared and used.

1. Twelve 48 hours' boiled blood agar plates of *B. influenzæ* were washed off with a total of 25 c.cm. of sterile normal salt solution. This emulsion was covered with toluol, and the whole well shaken for four hours. It was left in the incubator at 37° C. for 48 hours, and then filtered through a Chamberland "F" filter (sterile). This filtrate was used as Antigen 1.

2. This antigen was prepared as above, but the filtrate was extracted with 50 c.cm. of absolute alcohol for half an hour and then centrifuged. The deposit was again extracted with 20 c.cm. of absolute alcohol in a similar manner. The supernatant fluids from both extractions were combined and concentrated to 20 c.cm. by means of a water bath. This was used as Antigen 2.

3. The growth from 48 hours' old cultures of *B. influenzæ* grown at 37° C. on boiled blood agar was scraped off, and dried at 37° C. on glass plates. On scraping off the growth care was taken not to include any of the medium; 0·5 g. of the resulting dried bacilli was ground up in a mortar and extracted with 20 c.cm. of methyl alcohol. This was filtered through a sterile Chamberland filter, and the filtrate was used as Antigen 3.

The three antigens were titrated in varying dilutions—viz., pure, 1 in 5, 1 in 10, 1 in 20, and so on to 1 in 200. The fluid used for dilution was distilled water. A fresh normal serum was used in a dilution of 1 in 20 in normal salt solution to standardise the antigens.

In a series of perfectly clean tubes 9 c.cm. of the diluted serum were mixed with 1 c.cm. of the varying dilutions of the antigen to be tested. A control of 9 c.cm. of the diluted serum and 1 c.cm. of distilled water was put up. The tubes, after having been shaken, were put in the 37° C. incubator for two hours; these were then removed and the drop number of their contents ascertained when under similar temperature and pressure conditions. The antigen used was the strongest dilution which did not increase the drop number for normal serum beyond one drop for 1 c.cm. All the sera were tested in a similar manner. In no case was a positive result obtained—i.e., increase in the drop number.

Conclusions.

The apparatus was thoroughly satisfactory and accurate. The results point to one of two things—

1. That no miostagmin for *B. influenzæ* (Pfeiffer) was present in the sera tested; or—

2. That the antigens were not satisfactory. I have not been able to settle this point, as I have not as yet succeeded in getting an antigen to give a positive result with the serum from an influenza case.

(5) CARRIER QUESTION.

At the request of the Assistant Director of Pathology, Eastern Command, I did sample swabbing of the troops in this area to find out the carrier-rate for *B. influenza*. The results were as given in Table VII.

TABLE VII.

Date of swabbing.	Station.	Unit.	Number swabbed	Percentage.
11/2/20	Shorncliffe.	Hospital patients.	50	8%
13/2/20	Dibgate Camp.	M.G.C.	50	8%
15/2/20	Moore Barracks.	M.G.C.	50	14%
17/2/20	Ross Barracks.	R.F.A.	50	8%
21/2/20	Dover.	R.I.F.	50	14%
25/2/20	Dover.	R.W. Kents.	50	14%
4/3/20	Canterbury.	10th Hussars.	50	18%
4/3/20	Canterbury.	Buffs.	50	18%
13/3/20	Shorncliffe.	Hospital patients.	50	16%
19/3/20	Canterbury.	10th Hussars.	50	6%

This table is interesting when taken along with the occurrence of the epidemics. At the beginning of the Canterbury epidemic amongst the 10th Hussars the carrier rate was 18 per cent. At the end of the epidemic the carrier rate had fallen to 6 per cent.

It appears as far as one can judge from the small number of troops examined that a carrier rate approaching 20 per cent. indicates a danger of an epidemic. The powder, as it were, is there, but what puts the match to it is difficult to find out. One point noticed was that the epidemics at both Dover and Canterbury coincided with a spell of cold wet weather.

Inoculation as a Prophylactic Measure.

Between 700 and 800 were done personally. The reaction in healthy persons was in all cases remarkably mild. If, however, as was done in six cases, the inoculation is made when the person is suffering from an attack of coryza or bronchitis, no matter how slight, the symptoms were always markedly aggravated. In my own case I was suffering from a slight coryza when I gave myself the second dose. This became much worse, and developed into a mild attack of influenza. It was not recognised as such, until after about a week the nasal discharge became of a bright canary-yellow colour.

The colour excited my curiosity, and on culturing on boiled blood agar I got an absolutely pure growth of *B. influenzæ*. Whether I was a carrier or suffering from a slight coryza due to *B. influenzæ* before the inoculation, or whether I caught the infection after the injection (I was working amongst influenza cases at the time), I am unable to say.

Regarding the efficacy of the vaccine I have still an open mind. Influenza returns I disregard on account of the fallacies involved. It may be of interest to note that at Canterbury the 10th Hussars were practically entirely non-inoculated at the time of the epidemic, whilst at Dover the Royal Irish Fusiliers had been practically entirely inoculated quite recently—i.e., within two months. The severity of the attack was to all appearances the same in both units.

If the vaccine be given to a healthy person it certainly does no harm, and as there is a difference of opinion as to whether it does good or not I always recommend it.

(6) FINAL CONCLUSIONS.

From the work done it would appear that one would be quite justified in claiming that the *B. influenzæ* (Pfeiffer) was an infecting agent in all the Dover, Canterbury, and Shorncliffe cases. To go further, one can say that it was likely to have been the primary infecting agent, seeing that specific agglutinins and complement-fixing bodies were demonstrated in the blood of some cases as early as the third day of the illness. The cultural results, as well as a consideration of the fluctuations of the carrier rate, also favour the statement that *B. influenzæ* (Pfeiffer) was the causal organism.

In the Hythe cases *B. influenzæ* (Pfeiffer) does not seem to have been the causal agent, as has been shown both culturally and serologically. I should be chary in accepting the Gram-negative diplococcus, isolated in all the cases, as the causal agent until the cultural results were supported by some immunity test.

The whole work tends to point to the fact that clinical influenza may be due to more than one variety of infecting organism.

TREATMENT OF CHRONIC OTORRHŒA BY ZINC IONISATION.

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OTORRHŒA as a result of middle-ear disease may persist after the acute stage has passed owing to:—

(*a*) Irritation from accumulation of septic fluid in the tympanum proper—tympanic sepsis.

(*b*) Tympanic sepsis complicated by: (1) polypi and granulations, or carious bone in the middle ear; (2) overflow of septic fluid into the tympanum from adjacent parts—e.g., mastoid cells—or from the attic; (3) reinfection from the Eustachian tube or the external auditory canal—here there are temporary cures with frequent relapses.

(*c*) The nature of the infection—e.g., T.B.

When a microscopic examination is made of the discharge from a case of acute suppurative otitis media one variety of micro-organism is seen to be present alone or to greatly preponderate. In the chronic case, on the other hand, there is a mixture of many different organisms. It may be said that in the acute case the ear is "suffering from an infection," whereas in the chronic case the ear is "irritated by a confection." This constitutes what is called above "tympanic sepsis."

If a series of cases be examined and a diagnosis attempted as to the probable cause of chronicity in each it will be found that many may be ascribed to tympanic sepsis alone. This can be confirmed by treatment confined to the tympanum alone. Zinc ionisation is a method by which the tympanum can be disinfected without being irritated. In many cases no other treatment, or no repetition of the treatment, is necessary, and when the patient is seen again—next day, or in a week, or in a fortnight, as circumstances permit—the suppuration has entirely ceased and there is no sign of inflammation, the mucous membrane being pale and clean, and the remains of the drum not swollen or hyperæmic.

If it is observed at the time that the patient is treated that the mucous membrane is much swollen, or that some small granulations are present, it is advisable after ionising to insufflate a little boric acid to absorb any fluid exuded and to endeavour to keep it sterile.

Ninety-nine ears were recently treated. These cases were not selected, except in so far as only those were ionised which might be provisionally considered as owing their chronicity to tympanic sepsis alone. Most of the cases had already received treatment for a longer or shorter time by recognised applications.

The patients were instructed not to use any treatment at home and to be careful not to allow any water to enter the ear. The results may be classified thus:—

(*a*) Ears in which discharge ceased, 54.
Of these 5 relapsed: 2 due to causes undetermined, 1 to adenoids, 1 to cholesteatoma, 1 to Eustachian trouble.

(*b*) Ears of patients who did not return or are still under treatment, 25.

(*c*) Ears in which the discharge did not cease and in which it was discovered after ionisation that—
(1) Small polypi or granulations were present, 9;
(2) Attic disease, complete Eustachian obstruction, or some other complication existed, 8.

(*d*) Additional cases in which recovery may not have been due mainly to ionisation—e.g., to inflation, 3.

Zinc ionisation is useful for diagnostic purposes. If the discharge has not ceased after one treatment it is

usually easy to diagnose what is the reason, as swelling and inflammation have disappeared except at one place, or discharge is localised to one area. Where polypi have been dealt with subsequent ionisation will cure the discharge.

Three of the 54 cases used drops at home, two by mistake for a time, and the third had an incision into the drum where there was a tiny perforation and carbolic acid was applied to the margins; another had, besides ionisation, pure carbolic applied to a granulation. In the remainder treatment was only applied at the time of the patient's visit, and consisted in ionisation, with or without the insufflation of boric acid (or in a few cases of formidine) immediately after ionisation or subsequently if a little discharge was still present. 45 had one ionisation; 7 had two ionisations; 1 had three ionisations; 1 had four ionisations. The zinc ion was used in all. In two the salicyl ion was also used, and in two others the silver.

A few illustrative cases are submitted.

(A) Patient states duration of discharge.
(B) Diagnosed cause of chronicity.

No.	Age.	Ear.	(A)	(B)	Treatment.
5845	21	L	[illegible] years	T.s.	May 13, Zn Ion. 3 M.A., 15 min. ,, 17, No discharge.
AC 750	27	R	2 years	,,	May 18, Zn Ion. 3 M.A., 8 min. Ac. Bor. blown in. ,, 24, No discharge.
5460	15	L	Years	T.s.*	May 13, Zn Ion. 3 M.A., 13 min. ,, 20, Almost dry. Ac. Bor. ,, 27, No discharge.
2865	7	L	6 mths.	T.s.	June 3, Zn Ion 3 M.A., 10 min. Ac. Bor. ,, 17, No discharge. July 1, No discharge.
AC 171	41	R	2½ years	,,	May 11, Zn Ion. 2 M.A., 12 min. ,, 18, A little clear discharge. Ac. Bor. June 1, No discharge. ,, 22, No discharge.
6138	52	R	1¾ years	T.s.†	April 22, Pure Ac. Carbol. to polypoid portion of mucous membrane. May 6, Zn Ion. 3 M.A., 10 min. Formidine blown in. ,, 20, Almost perfectly dry. Ac. Bor. July 1, No discharge.
8170	4	R L	12 mths.	?	June 28, Zn Ion. 1½ M.A., [illegible] min. July 5, No discharge. ,, 5, Zn Ion. 1½ M.A., 5 min. ,, 12, No discharge either ear.
7515	24	R	1 year.	T.s.‡	July 5, Zn Ion. 3 M.A., 14 min. ,, 12, No discharge.
2392	33	R	More than 4 yrs.	T. s.	March 11, Salicyl. Ion. 2 M.A., 10 min. Zn Ion. 2 M.A., 10 min. ,, 18, No discharge. April 15, No discharge.
7024	31	R	2 mths.	,,	June 24, Zn Ion. 3 M.A., 10 min. July 1, No discharge.
6278	26	R	15 years	T.s.‖	May 10, Zn Ion. 3 M.A., 10 min. ,, 13, Nearly clear mucus, in moderate amount. Ac. Bor. blown in. ,, 17, No discharge. ,, 20, Slight discharge. Meatus still inflamed. Zn Ion. 3 M.A., 15 min. ,, 31, Some mucoid discharge. Meatus much less inflamed. Granulation posteriorly. Ac. Bor. blown in. June 3, Zn Ion. 2 M.A., 10 min. Ac. Bor. ,, 7, A little mucus. Ac. Bor. ,, 10, Almost dry. Ac. Bor. ,, 14, No discharge noticed. Ac. Bor. ,, 17, 21, 24, 28, No discharge. July 1, 5, 12, No discharge.

T.s., tympanic sepsis. * Pockets due to adherent drum. † With polypoid condition of mucous membrane on inner wall. ‡ ? aditus. ‖ ? attic, meatus inflamed.

All the visits and treatment from the time ionisation was given till the discharge ceased are mentioned.

It is not yet possible to estimate exactly what is the proportion of patients suffering from chronic otorrhœa attending the special department of a general hospital in which it may be expected that cure will rapidly follow ionisation. I know it is large.

In conclusion, I wish to express my best thanks to Mr. Gay French, of the Royal Free Hospital, and to Sir James Dundas Grant of the Aural Clinic, Ministry of Pensions, for the facilities which they have freely granted me to treat patients. I am greatly indebted to them.

SOME OBSERVATIONS ON THE TREATMENT OF GONORRHŒA WITH DETOXICATED VACCINE.

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IN the following series of cases the clinical work and treatment has been carried out by W. V. C. and the preparation of the vaccine and the performance of the complement-deviation tests by T. E. O. The vaccine was prepared according to the method described by Captain D. Thomson, R.A.M.C., in THE LANCET of June 28th, 1919, and the complement-deviation tests performed on the lines laid down in the Medical Research Committee's Special Report Series, No. 19.

At the outset we decided that it would be of interest to take a series of cases and treat them with detoxicated vaccine in order to judge its effect upon them both "clinically" and serologically. At the same time a series of "controls" was commenced, these cases receiving no vaccine. The cases will be referred to as "test" and "control" cases respectively, and the abbreviation C.D.T. will be employed for "complement-deviation test."

Method.

With this end in view all cases which were admitted to the hospital suffering with acute gonorrhœa, and in whose urethral smears gonococci were present, were placed in one or the other series. All cases were submitted to treatment on the same general lines—i.e., irrigation of the anterior and posterior urethra with pot. permang. 1/12,000, increasing gradually to 1/4000 as the acute symptoms subsided. General treatment comprised a milk diet for the first four days, a minimum amount of exercise throughout, while medicinally alkaline mixtures, mist. alb., and belladonna suppositories were employed. Smears were taken on an average once a week, and urines were examined twice weekly.

Tests of Cure.

1. "Dry" after a "hospital pass" granted for three days a week from 2 to 7.30 P.M.
2. Passage of straight sounds.
3. Examination of first and second urines, and urine after prostatic massage, both macro- and micro-scopically.
4. Observation of the patient for an average of 28 days after he showed no further urethral discharge, during which period he was doing fatigues and physical training (half an hour twice daily).

Special Treatment.

The 123 "test" cases received detoxicated vaccine commencing on the day of admission. The first 18 of these "test" cases received a total of 40,000 millions spread over a period of 30 days, but for reasons to be stated later this was given up and the remaining 105 received a total of 60,000 millions given as follows:—

	Dosage.		Dosage.
1st day	5,000 millions	20th day	10,000 millions
5th ,, ...	5,000 ,,	25th ,, ...	10,000 ,,
10th ,, ...	7,500 ,,	30th ,, ...	15,000 ,,
15th ,, ...	7,500 ,,		

The vaccine was given subcutaneously alternately into either arm. The 64 "control" cases received no vaccine.

Results.

Table I. shows the results obtained, and Table II. is an analysis of the "test" cases.

TABLE I.

(A) Average duration of disease in days before commencement of treatment.
(B) Average number of days to disappearance of discharge (includes relapses and duration of relapses, if any).
(C) Number of cases developing complications.

Class of case.	Total No. of cases.	(A)	(B)	(C)	Per cent.	Relapses.	Per cent.
Test	123	4·2	38·5	6	4·9	11	8·9
Control...	64	3·5	48·4	10	15·6	3	4·7

TABLE II.
(A), (B), (C) as in Table I.

Test cases.	Total No. of cases.	(A)	(B)	(C)	Per cent.	Relapses.	Per cent.
Uncomplicated	93	2·9	41·3	6	6·5	10	10·8
Admitted with complications.	17	10·9	35·6	—	—	—	—
Admitted as "relapses."	13	5·5	22·0	—	—	1	7·7

It will be seen that the average duration of the disease including relapses of cases treated with "detoxicated" vaccine (test cases) is 38·5 days, as compared with 48·4 days for cases receiving no vaccine (control cases), but otherwise under identical conditions.

As regards *complications*, of 93 "test" cases 6 developed complications (5 epididymitis and 1 arthritis) = 6·5 per cent., whereas of the 64 control cases 10 developed complications = 15·6 per cent. On the other hand, of the 123 test cases 11 relapsed = 8·9 per cent. against 3 relapses = 4·7 per cent. of the 64 controls.

We should like to point out, however, that of the 123 test cases the first 18 were treated with only a total of 40,000 millions detoxicated vaccine (initial dose 2500 millions), and these 18 cases were responsible for 4 relapses. (It was for this reason that the remainder received the larger doses of detoxicated vaccine.) Another point worthy of note is that in calculating the days of duration of the disease the period of relapses is included; this therefore increases the significance of the shortened period of the disease.

It was noted by one of us (W. V. C.) that "test" cases admitted with or developing complications during treatment ran a milder course than those not treated with detoxicated vaccine. Only 1 case of the 123 cases showed any marked local reaction, and no uncomplicated case showed any local or general reaction. Complicated cases varied in the intensity of the reaction, two cases of arthritis complained of slight transient increase of pain in the joints, one epididymitis case complained of great pain in the testicle and his temperature went up to 103° F., other epididymitis cases complained of a varying amount of increase in pain in the testicle; in none of these cases was the vaccine treatment stopped, and in all cases good progress was made; in every case where any reaction occurred it did so within 24 hours. A large majority of these cases showed a very marked improvement in the urethral discharge between the fourth and fifth dose of vaccine, and some cases became "dry" at this period in an almost dramatic fashion.

Complement-deviation tests were performed (by T. E. O.) within seven days of the completion of the vaccine course on 121 of the 123 test cases, with the following results:—

Total cases 121 { C.D.T. 64 showed a negative result.
,, 57 ,, positive ,,

In 20 of these cases C.D.T.'s were done before the first, after the fourth, and after the seventh dose of vaccine. This showed:—

At start	After 4th vaccine	After 7th vaccine
20 neg.	8 neg.	8 neg.
Nil pos.	12 pos.	12 pos.

The reason for doing a C.D.T. after the fourth vaccine was to ascertain whether there was any relationship between the clinical improvement at this period and the fixation of the complement. Of 25 control cases in which the test was done 17 showed a negative and 8 a positive result at the time of presumptive cure.

A further analysis of 121 "test" cases showed that in the 64 cases in which the result was negative at the end of treatment the average duration of the disease was 38·9 days, and in the 57 cases in which the result was positive at the end of treatment the average duration of the disease was 38·7 days.

Conclusion.

In conclusion, we would like to state that we realise that the number of cases taken is too small for any really reliable deduction as to the value of detoxicated vaccine to be drawn, still in view of the fact that cases have been taken serially and not picked, and that test cases and controls were treated on exactly parallel lines, and that all were submitted to a long period of observation, it is noteworthy that the average duration of the disease in test cases was 38·5 days as compared with 48·4 days of controls—a decrease of nearly 10 days per case.

All through the period of the tests, which has extended over a year, we have tried to keep a perfectly open mind, and no calculations contained herein were made until the series was closed. Our thanks are due to Major C. F. White, O.B.E., R.A.M.C. O/C, Military Hospital, Rochester-row, S.W., for permitting us to make this investigation and allowing us to publish the results.

HERPES AND CHICKEN-POX.

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A CONSIDERABLE amount of interest has been taken recently in the question of the alleged relationship of herpes and chicken-pox. Although at first sight it may appear extremely improbable that there is in reality any connexion between two conditions which we have been accustomed to regard as entirely separate entities, and which in the vast majority of instances present only very superficial resemblances, a study of recent literature will, I think, compel an unprejudiced reader to regard the question as one which deserves serious discussion. A few years ago I was quite content to assume that the interesting occurrences from time to time reported in the journals could be readily explained by coincidence. The coincidences, however, are getting sufficiently numerous to be somewhat puzzling; and a brief review of the whole subject may be not without interest.

Bokay,[1] in 1892, reported that he had seen nine cases in which chicken-pox appeared from eight to 20 days after an attack of herpes zoster had affected another person in the same family or hospital ward, and when the possibility of the chicken-pox having arisen from any other source apparently could be excluded. More recently numerous similar occurrences have been described by other observers, and Le Feuvre[2] in particular has stoutly maintained the theory of the identity of the two conditions, and has made an interesting collection of cases gathered from the literature.

Before discussing, however, the cases which have been reported up to date it may be well to consider whether by any possibility errors of diagnosis may account in some degree for the now acknowledged frequency with which one of these diseases follows the other. Are there, in the first place, abnormalities in the distribution of the eruption of chicken-pox which might tend to a diagnosis of herpes being arrived at; and secondly, can the herpetic eruption assume such a character that chicken-pox might reasonably be suspected? Both these questions can, I am inclined to think, be answered in the affirmative.

Abnormal Distributions of the Chicken-pox Eruption.

It is, of course, well known that in small-pox a concentration of the eruption may be determined by local pressure or irritation on any part of the body, and sometimes in areas where, under ordinary conditions, the pocks may confidently be expected to be sparsely scattered. Good examples of such concentrations are not infrequently observed after the application of a mustard leaf during the initial fever, and at the site of the collar stud, the bootlace, or the garter. It is, perhaps, not so well appreciated that the eruption of chicken-pox may be influenced in its distribution by similar causes, although the normal distribution in this disease is such that we would not naturally expect such abnormalities to occur nearly so frequently as in such a fever as small-pox, in which the distribution appears to be determined almost entirely by the comparative amount of exposure, friction, and irritation of the

different areas of the skin. Hamburger[3] has suggested that some of the alleged cases of herpes zoster, which have been followed by chicken-pox, may have been in reality cases of chicken-pox itself with the eruption determined in its distribution by such a cause as the pressure and friction of badly fitting corsets. We see occasionally infants whose eruption is particularly profuse in the region covered by the napkin as the result of irritation by the excretions. I have had under my care a boy whose clavicle was fractured during the incubation period of chicken-pox, and who presented on the shoulder, arm, and chest on the affected side a spotting at least three or four times more profuse than on the other parts of the body, this distribution being due to the bandages. Another recent case, a young lady, who had very typical discrete chicken-pox lesions on the trunk, showed on the face such a copious and closely set eruption that she gave quite the impression of small-pox, especially as the brow and prominences of the face were much more affected than the less salient parts. This was easily explained by the fact that she had just returned from a week-end in the country, where she had spent her time sitting in the sun, and the irritation of the sunburn had determined the localisation of her eruptions. Similar cases have been reported by Gautier[4] as occurring in children who were being treated by heliotherapy. Another patient of my own who developed his chicken-pox only four days after an intense scarlet fever rash had an unusually profuse eruption on the trunk and extremities, and yet had only two or three vesicles on the face. This suggested that, had not the fever occurred during the incubation period, he would probably have had a very scanty eruption, whereas the skin hyperæmia caused it to be very copious on the trunk and limbs, while the face, spared by the scarlet fever rash, presented, as it were, more resistance. It is noteworthy that in this patient the forearms were affected quite as much as the trunk, not a very usual occurrence in varicella.

I cannot say, however, that in any of these cases was the eruption grouped in a herpetic manner. It is nevertheless conceivable that cases might occur in which a concentration, determined by some unrecognised form of irritation, might suggest herpes to a not very careful observer. I do not lay stress on the probability of this, but its possibility is, none the less, worth noting. I have, on the other hand, seen two cases of undoubted chicken-pox in which the eruption, at first indistinguishable from herpes, became afterwards generally distributed over the body. As will be seen below, it might be possible to consider these cases as the concurrence of chicken-pox and herpes in the same individual, and Dr. Le Feuvre has, in a letter to myself, already claimed them as such. I am far from saying that he is not right, but in the meantime I prefer to put them on record merely as illustrating a possible anomaly in a chicken-pox eruption.

CASE 1.—A small girl developed what appeared to be an absolutely typical herpetic patch over the left shoulder-blade. Next day, however, a few outlying vesicles, one apparently typical of varicella, appeared in the neighbourhood of the patch, and one or two more on the right side of the back. There was nothing at any time below the waist-line and nothing on the face, scalp, or limbs. I sent her to a chicken-pox ward where she did not contract the disease, and, 17 days after her removal, one of the children who had been exposed to her developed chicken-pox.

CASE 2.—Another little girl, a few days after admission with diphtheria, developed an unusually copious herpetic eruption. The distribution on the first day was entirely limited to the area supplied by the posterior divisions of the dorsal spinal nerves, but was equally well marked on both sides along the spine. Next day there was one spot on the face, and herpetic groups above both elbows, limited apparently to the supply of the upper division of the external cutaneous branch of the musculo-spiral nerve. On the succeeding days, however, other vesicles much more typical of chicken-pox appeared on the flanks, chest, and abdomen, and two other children in her own home were reported as having developed ordinary chicken-pox on the day of her attack.

Generalisation of the Eruption of Herpes Zoster.

We must here assume that it is possible for herpes zoster to become "generalised"—that is to say, to develop outlying vesicles which may be distributed over the whole body. There is much to be said against such an assumption, particularly on anatomical grounds, but it is in any case necessary to refer to the cases which have been described under this name, whether we ultimately decide to regard them as instances of herpes, of concurrent chicken-pox and herpes, or of chicken-pox alone. Parkes Weber[5] has reported two interesting examples of this condition (one of which, it may be mentioned, was followed by chicken-pox in another individual), and has gathered from the literature some 20 references to it. He quotes, in particular, Minet and Leclercq,[6] who collected 25 cases of generalised herpes and who state that the aberrant vesicles may appear simultaneously with the outbreak of the typical zoster or may develop from a few hours to a few days after it. The latter was the case with Parkes Weber's patients, in whom the generalised eruption did not manifest itself for five days after the zoster in one instance and at the end of the first week in the other. In these cases of so-called generalised herpes we find the aberrant vesicles described as resembling closely those of varicella. They seem to be less deeply seated than those of ordinary herpes, and than those of the original patches with which they seem to be connected, and heal more quickly and with less cicatrisation. In one of Le Feuvre's papers[7] an account of nine cases collected from the literature is given, and there seems to be no doubt in his mind that the condition is one of herpes and chicken-pox combined, and depends upon an identical virus. If he is right, the two cases which I have reported above appear to be of the same nature. In both the chicken-pox was undoubted, and in both it followed within two days a condition originally diagnosed as herpes. I have seen, however, another case in which a definite diagnosis of chicken-pox could not be made, and which appears to conform more closely to what has been described as generalised herpes.

CASE 3.—A male of 55 years was sent into hospital as suspected small-pox. He reported that five days previously he had suffered from shivering and pain in the lower part of the back. He had also had some fever up to the time of admission. On examination I found a few dry vesicular lesions on the scalp and one or two on the face. There were several on the trunk, of which one or two were well filled and somewhat varicella-like in appearance, while others were dry and crusted. In particular, there was one very suggestive oval crust on the right shoulder-blade. Only one vesicle was observed below the elbows, and the legs were free of any spotting. Round the anus on the left side was a profuse eruption of typical herpes with some outlying vesicles, which were identical in appearance with one or two noticed in the sacral region. On the following day fresh herpetic groups were apparently struggling to come out on the inside of the upper part of the left thigh, and a small herpetic patch was observed on the left side of the scrotum.

If we are to regard this case as one of generalised herpes it may be noted that the eruptions, whether herpetic or varicella-like, appeared probably simultaneously. The pain in the back which caused the suspicion of small-pox was undoubtedly due to the fact that the sacral nerves were those chiefly affected by the herpes. I am far from convinced that the scattered vesicles and crusts were actually those of chicken-pox. There was no history that the patient had previously suffered from that infection, but he could not state with any certainty that he had not had it.

Association of Chicken-pox with Herpes.

Le Feuvre, who has done much to stimulate interest in this question, was able in 1917 to collect 50 examples of herpes preceding, following, or coexisting with chicken-pox. Since that date several other instances of this curious association have been from time to time reported.

A. *Cases of herpes zoster followed by chicken-pox.*—It is into this group that most of the cases reported in the literature fall. A case of shingles occurs, and after an interval, approximating to the ordinary limits of the incubation period of chicken-pox, a contact, usually a member of the same family, develops varicella. Out of Le Feuvre's 50 cases no less than 41 are of this type, and seven of these were observed by himself. In a paper of a later date he has added two more. In every instance the interval elapsing before the appearance of the chicken-pox fell between the limits of 12 to 21 days. To the papers of Le Feuvre and to that of Parkes Weber full lists of references to the literature are appended, and I will content myself here with the mention of more recent observations.

Cranston Low[8] has reported two cases, Taylor[9] four, and Charpentier,[10] Dingwall Fordyce,[11] and C. Wilson[12] one each.

I take this opportunity of putting on record four cases of my own.

CASE 4.—On Dec. 23rd, 1918, a child suffering from whooping-cough developed a typical herpes zoster with no outlying vesicles. On Jan. 7th a child in the same ward was discharged from hospital and developed chicken-pox within a week of her return home. The date on which the first vesicle appeared was not ascertained, but it was quite clear that the onset of the eruption was within 21 days of the appearance of the herpes in the other patient. A few presumably unprotected children, however, who remained in the same ward escaped infection.

CASE 5.—A girl of 8, suffering from scarlet fever, developed a typical herpes zoster on Sept. 23rd, 1919. On Oct. 11th, 18 days later, two children, aged 5 and 6 years, whose beds adjoined that of the herpes patient, presented a characteristic chicken-pox eruption, and on the following day a third child, aged 9, who occupied the bed exactly opposite, also developed chicken-pox.

CASE 6.—In the same year, 1919, a scarlet fever patient in another ward had a typical attack of herpes zoster. This was followed 25 days later by an outbreak of chicken-pox affecting several children. As the herpes case was not removed from the ward, this long interval does not exclude a possible incubation period, as, if the infection was really derived from the herpes, it need not necessarily have been contracted during the first three or four days of that condition.

CASE 7.—In 1918 a child was admitted with chicken-pox from Dr. J. S. Fowler's wards in the Royal Hospital for Sick Children. There had been no obvious source of infection, but a case of herpes zoster had occurred in the ward 19 days previously.

It must be understood that in all these cases any more natural source of infection was, so far as possible, excluded. As regards two of my own, in particular, it may be noted that they occurred in convalescent scarlet fever wards. Now, with a view of keeping these wards quite free from secondary infections, no patient is transferred to them before he has been at least three weeks in hospital and has therefore terminated the period during which any infection contracted before admission is likely to develop. As a result, with the exception of post scarlatinal diphtheria which is due to undetected carriers, it is most unusual for secondary infections to occur in convalescent wards, and it is remarkable that, on two of the rare occasions on which chicken-pox has made its appearance there, herpes should have preceded it. Nevertheless we cannot entirely exclude the possibility of "missed" cases of chicken-pox having been responsible for infection in these cases, or, indeed, in the other cases, reported in the literature.

The cases in this group, including those of Le Feuvre, those quoted above, and my own additions, amount to 56 in all. No doubt there are others in the literature which I have missed.

B. *Cases of chicken-pox followed by herpes.*—It appears to be much more unusual for herpes to follow chicken-pox within the limits of a possible incubation period, but none the less such cases have been reported. Le Feuvre collected five in his original series, and in a later communication added one more. I am unable to make any addition to this number, neither having had such an experience myself nor having been able to find in the literature since 1917 accounts of similar occurrences. The number of them, indeed, appears to be so small that the theory of coincidence does not, so far as this particular group of cases is concerned, seem to present any difficulty.

C. *Cases of herpes and chicken-pox in the same individual at the same time.*—It has been mentioned above that the two cases (Cases 1 and 2), which I have preferred to describe as examples of chicken-pox starting with a herpetic distribution, might be regarded as instances of this combination, and it will be admitted that generalised herpes may account for some of the cases reported, especially if they are not followed, as was one of Parkes Weber's, by an outbreak of chicken-pox after a suitable interval. Thus the rash, "indistinguishable from varicella," which appeared a week after the onset of characteristic dorsal and lumbar herpes, recently described by Downes,[13] might well have been generalised herpes, and, as the children of the family had never had chicken-pox and did not contract it, this presumption is to some extent strengthened. Le Feuvre includes 4 cases in his series of 50 which he is satisfied were in reality instances of herpes followed in the same individual by chicken-pox within a few days—that is, two days to a week. I have not noticed any others in the recent literature. Dr. D. W. Scotland, of Colinton, has told me that one of his patients, a lady of 50 years, developed a severe attack of chicken-pox a fortnight after the onset of lumbar herpes. The interval here is much longer than has been usually noticed, and we can hardly explain such a case either on the theory of a generalised herpes or of a chicken-pox with an originally herpetic distribution. Although no source of infection was detected and the coincidence is a very curious one, it seems not improbable that there was no real connexion between the two attacks.

D. *Cases of chicken-pox and herpes appearing simultaneously in different individuals.*—Cranston Low[8] reports that a patient in a ward of the Edinburgh Royal Infirmary developed a typical right-sided thoracic herpes zoster. Two days later a child in the same ward developed chicken-pox. Both these patients had been in hospital several weeks, and it is suggested that the infection had been introduced by visitors. Oakes[14] in 1913 reported that he saw two children in one household on the same day, one with typical shingles, the other with typical chicken-pox. Gray[15] has put on record a similar occurrence. Three brothers were admitted to hospital with scarlet fever. The eldest, who had no previous history of chicken-pox, had well-marked right-sided herpes zoster, and had one or two spots on the left side of the chest which, on healing, left scars suggestive of chicken-pox. Four days later one of the brothers developed chicken-pox, which the younger child took from him after the usual incubation. Unfortunately it is not stated whether the herpes had been long present before admission or had only just appeared, but if the latter, the case appears to fall into this group.

Epidemic herpes.—It is interesting to note that, in addition to the curious association of the two conditions as exemplified above, there is some evidence that herpes occasionally appears in what might be described as an epidemic form; that it is unusually prevalent, for instance, in a particular place at a particular time. This, of course, might mean nothing more than that it is influenced by climatic conditions, of which as yet we know nothing. Further, it has been reported as being epidemic along with an epidemic of chicken-pox. Heim[16] has recorded such an occurrence in 1912 at Budapest.

Theory of the Identity of the Virus.

It is on such facts as have been collected above that some observers have come to the conclusion that the virus of herpes and chicken-pox is one and the same. This view is strongly held, both by Le Feuvre and Cranston Low. The latter has advanced the ingenious theory that in herpes the infection is local, through the nose and along the lymphatics round the olfactory nerves, as has been shown to be the case in anterior poliomyelitis, whereas in chicken-pox there is a blood infection with the virus. In the combined cases it is presumed that the infective agent reaches the spinal ganglia first, and a few days later invades the general circulation.

Difficulties in accepting the identity theory.—Admitting that it is not easy, in the light of the above facts, to exclude absolutely the possibility of a real relationship between the two conditions, much yet remains to be explained. The question of immunity, for instance, requires careful consideration. Many patients who suffer from herpes have undoubtedly had chicken-pox previously, and there is no reason to believe that herpes confers any protection against chicken-pox. For example, Savill[17] mentions an instance of a boy developing herpes five months after an attack of chicken-pox, and Dr. Scotland's case, mentioned above, shows that chicken-pox can follow closely upon herpes. Are we to assume that the general blood infection is not sufficient to make the individual immune to the local nerve infection and vice versa? Moreover, herpes does not protect against itself, second attacks being known to occur. J. Taylor[9] has recently reported instances of such second attacks. Cranston Low doubts if such recurrences are genuine herpes, and attributes them

to the irritation of recurrent attacks of peripheral neuritis, but, after all, as second attacks appear to be rare, the mere fact of their existence is no real argument against the infectivity of herpes, as they occur occasionally in all the infectious diseases. But, from another point of view, herpes does not behave as if it depended on a living virus. The frequency with which it has been reported to appear during a course of treatment with arsenic is very difficult to explain on any theory of infection. Le Feuvre seems inclined to brush this difficulty aside and seriously to consider the possibility of an infectious disease arising *de novo* under suitable conditions, a line of argument in which I am not prepared to follow him. Otherwise it must be assumed that arsenic renders the individual especially susceptible to infection, and that the possibilities of such infection are much more frequent than can easily be imagined.

Discussion.

Looking at the subject as a whole it seems not unfair to conclude that the small number of cases in the second group—that is to say, chicken-pox followed by herpes—may readily be explained by coincidence. Further instances of this sequence certainly should be reported before we can lay much stress on it. Secondly, the cases in the third group, that of the two conditions co-existing, may be accounted for either by chicken-pox starting for some unknown reason with a herpetic distribution, or by the phenomenon known as "generalised herpes." Some, it is true, may question the possibility of herpes becoming generalised, though, if we grant that herpes depends upon a virus, there is no particular reason why that virus should not occasionally be diffused through the nervous system much as that of anterior poliomyelitis appears to be in certain instances. On the other hand, the two conditions may coexist in this group of cases quite fortuitously, though the regularity with which, in the cases reported, the general eruption has followed the local one within a week, suggests that there is a definite connexion between the two. The fourth group, again, simultaneous attacks of herpes and chicken-pox in different individuals, might well, from the small number of cases recorded up to date, depend upon coincidence. So far, then, as these three groups are concerned, the case in favour of an identical virus does not appear to be a strong one, though they assume an undoubted significance as long as the occurrences in the first group remain unexplained.

It is, in fact, the first group for which it is difficult to supply an adequate explanation. A large number of instances have been reported in which chicken-pox has followed herpes in another individual, and always within the limits of the incubation period of the former disease. If chicken-pox appeared as commonly two months after herpes as it does within three or four weeks, I cannot doubt that that fact would have been put on record, and it is this occurrence of an apparent incubation period which compels most attention and which cannot be put lightly aside. We probably all have a prejudice in favour of keeping what we consider different diseases in watertight compartments, as it were, but, after all, we know singularly little about them, and it is quite possible that the same virus may behave quite differently under different conditions. As it is, the fundamental identity of diseases as different in their symptomatology as influenza, anterior poliomyelitis, encephalitis lethargica, and cerebro-spinal fever has been seriously suggested and discussed, and although I am far from accepting such a view, particularly as regards cerebro-spinal fever, it is obvious that the same poison acting on different structures might be expected to cause different symptoms.

The key to the mystery lies, I am convinced, in the hands of the general practitioner. All cases in which any association of the two diseases is noticed should be carefully noted and put on record. What I think is equally important is to keep a note of all cases of herpes which, occurring in a family where there are susceptible children, are *not* followed by chicken-pox. For instance, in the last four years seven cases of herpes zoster have occurred in the Edinburgh City Hospital in wards in which there were one or more children who had not previously suffered from chicken-pox. Three of these cases have been followed by outbreaks of chicken-pox otherwise unexplained. It must again be repeated that the possibility of a missed case of chicken-pox being the real cause can never be entirely excluded, especially when one remembers that the whole eruption of that disease may be represented by one spot and in consequence very easily overlooked. A series of similar observations, however, would give us some idea what percentage of cases of herpes are followed by chicken-pox, and should such a percentage be found to be considerable the relationship between the two conditions might be more reasonably accepted. The proportions, moreover, of herpes patients who have or have not previously suffered from chicken-pox would be an interesting addition to our knowledge. Attention might also be given to the question of second attacks of herpes and to the dates on which herpes occurred in the practices of the observer and his neighbours with a view to investigating epidemicity. All that is required is a certain number of practitioners—say one hundred—willing to note such facts for a period of three or four years. Still more light would be thrown on the subject if a few medical officers of health would persuade their local authorities to follow the example of Bulawayo, which, no doubt at the instance of Dr. Le Feuvre, has made both "shingles" and "chicken-pox" notifiable diseases. But until a considerable mass of information can be obtained we must, I fear, leave the question an open one, recognising at the same time that such information is necessary before we can, with any justice, absolutely repudiate the theory of identity.

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THE ANALYSIS OF A FUGUE.

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THE following case may be of sufficient interest to warrant publication, inasmuch as the events which led to the final dissociation reveal themselves in well-ordered sequence.

X.Y.Z., aged 43, single, joiner, a native of East Anglia, who had lived in Manchester for some eight years, was admitted to this hospital on June 9th, 1920, with a history of having unaccountably left his home in Manchester on the previous Whit Sunday morning, May 23rd. His friends heard nothing of him till Thursday, May 27th, when the police reported that he was in a certain workhouse infirmary some miles from his home. He had been picked up in an exhausted condition the previous (Wednesday) midnight unable to give an account of himself and was taken to the infirmary. There he could not give his name, address, or occupation, and his mind was an absolute blank for all events in his past life prior to the previous Tuesday morning (May 25th), when he woke up to find himself in a strange park, except that he spontaneously recalled air raids in France. Other events of his army life were as completely forgotten as his civilian career.

A tram ticket from Liverpool to St. Helens which was found on him aroused no associations, and he was eventually identified as the result of a telegram sent from St. Helens on Whit Monday to his fiancée, telling her not to worry, that his head was bad, and that he would soon be home. This enabled the police to trace him.

Apart from the memory of air raids, the only link with his past which was revived in the infirmary was due to the policeman who took him there. This officer, himself from the Eastern Counties, recognised the patient's accent, and this aroused some nebulous associations in the latter's

mind, but not sufficient to enable him to say where his old home had been. On Saturday, May 29th, his fiancée, accompanied by a friend well known to him, arrived at the infirmary to take him back to Manchester. He did not recognise either of them, and Manchester, including the house and friends with whom he had lived for years, was entirely new to him. He astonished his landlord by asking where he could wash, receiving a reply more curt than courteous. Similarly a friend from his old home, who arrived a few days later in response to a telegram, was unrecognised, though a photo of the latter's young daughter aroused some unsystematised associations. The same photo portrayed the patient's nephew, whom he had seen as recently as last year, but he did not recognise the boy at all.

Condition on Admission to Hospital.

Z. continued in this condition until his admission here on June 9th. He was taken to a medical board on June 3rd, passing streets formerly familiar but now entirely strange to him: at the board the note was made, "Remembers bombing at Etaples and very little else." He accepted the statements of his friends as to former occurrences, his engagement, &c. (his fiancée obviously resembling a photo which he had in his possession), so that he was able to give an incomplete account of much of his past life. This knowledge, however, was not a recall of past impressions, but was, to him, new matter which he had learnt since his return to Manchester on May 29th.

The events narrated lacked the tang of reality for him, and he was still quite ignorant of the occurrences which had transpired unknown to his friends; for example, the happenings of Whit Sunday and Monday. His fiancée told him that on the Saturday preceding Whit Sunday he had been to B——l with her in the afternoon; he could not recall this, even after being told about it. Similarly, his joiner's shop was examined by his friends, and a bag of valuable tools, which he was accustomed to take out with him when working, was missing; he did not know of the existence of his shop and still less where the tools were. Again his friends told him that on the Whit Sunday morning he was going to fetch a new suit of clothes from his tailor's private residence. He had no idea of the tailor's name or address, or that he was getting a new suit at all. (It subsequently transpired that it was a newly opened shop where Z. had never dealt before, and his friends did not know of it.) A more serious matter was that he had securities deposited somewhere representing a large sum of money; he had no recollection of owning the securities or of where they were. His fiancée knew of them, but he had never told her where they were deposited.

As opposed to the amnesia for his past life, including the first two days of the fugue, his memory for events since he woke up in the park on Whit Tuesday morning, May 25th, was perfect, but it was a new existence sharply and absolutely demarcated from the former one. To recapitulate, therefore, apart from memories of bombing, he had amnesia for practically everything up to the morning of May 25th, except what he had re-learnt about himself during his stay in Manchester between his return on May 29th and his admission here on June 9th, while he remembered everything that had transpired since May 25th, but could not link up these later events with anything that had happened previously.

It was at once evident that this was a perfectly genuine case and not the aftermath of a Whitsun spree. Z. was a most respectable and well-conducted man, a lifelong abstainer, whose previous career could be vouched for by responsible witnesses. It may also be stated that subsequent hypnosis confirmed that he had drunk nothing stronger than minerals during his wanderings. The past history was incomplete at this stage and will be considered later, but an arresting fact came to light at the first interview. On Whit Sunday, 1918, a fine and hot day, he had been through a severe air raid at Etaples, subsequently being taken for safety to a wood near a railway some kilos away, and on an equally fine and hot Whit Sunday two years later he had wandered from his home, "waking up" two days later by a railway bridge in a wooded park in Lancashire.

Hypnosis of Patient.

Owing to unavoidable circumstances it was not possible to give Z. much attention for a few days, and as, curiously enough, the sergeant who had drilled him as a recruit in 1917 happened to occupy the next bed—though Z. did not at first recognise him—the two men were sent about together to endeavour to recover the lost memories. This succeeded to a limited extent, but the revived memories were confined to the period of their training together at Scarborough, and were probably, to some extent at least, "suggested" by the sergeant. As soon as opportunity offered, therefore (June 21st), I decided to hypnotise the patient. The commencement of the amnesia was vague and affected occurrences of years ago, so the first hypnosis was primarily devoted to recalling the events of the Whit Sunday and Monday. Z. readily passed into deep hypnosis, and most of the dissociated memories of the fugue were recovered. In places the story was sketchy, and the suggestion was given[1] that he would afterwards dream of the events he had spoken of during hypnosis, that any gaps would be filled up, and that after the dream he would remember them all as having actually occurred in real life, and would write them out on waking. This he did, and next day brought the following account of his journeyings:—

The Patient's Story.

"I remember on Whit Sunday morning having a nasty headache and a feeling I must get right away. It was a very hot day. I remember getting on a car and going to Stockport; from there to H—— G——, calling at a small shop for some sandwiches and biscuits. The people were just coming out of church. I then walked through some fields by this church to some woods near B——l, where I remained nearly all the day. I remember the sun being very hot, and my head still aching, with a desire to still wander on. I remember at the time I bought the biscuits, &c., I changed a ten-shilling note, and left in a wallet eight pounds. While in the wood I also remember coming out and going to a small house on the road and having some tea and bread-and-butter, which would be, I think, about 7 or 8. I then had a feeling I ought to be going home, but could not remember where I wanted to go, so kept on walking and wandering about till midnight, when I had a sleep in a barn, somewhere, I think, near A——m; it was a beautiful moonlight night when I awoke. I still went walking on across country till I came to a place called M—— G——, and then into S——n, where I met some colliers going to work, which I think would be about 5 o'clock. I remember telling them I wanted to get to some big town, but I could not remember the name. They told me how to get to Liverpool by car, as I told them it was a long way I wanted to get to. I got on a car to Ath——n, where we had to change again. I remember getting off the car and seeing some children dressed in white. It came to my mind all of a sudden then; I had promised to go with my young lady to watch the procession at Manchester. I was then close to a small house where they sold mineral waters, teas, &c. There were two cycle motorists came up at the time. I can remember tearing a piece of paper out of the wallet I had and asked them if they would take a telegram to the nearest post-office for me as I was not feeling well. I remember giving them this and a shilling; they said they were going to St. Helens. I then went in a field close to and ate some sandwiches I had left and went to sleep, as I felt so tired. When I awoke my head was much worse; I did not remember anything about sending the telegram. I was still anxious to get to Liverpool. I got on a car to A——n, and from there to St. Helens, went into a refreshment-room and had a good breakfast, then got on a car to Knotty Ash, where we had to change again for Liverpool. Before resuming the journey I went in a small wood close to and lay down for a while, and then went on a car again which had on the front "Pier Head," which took me right into Liverpool. I then remember going to a station, and having a good wash, as I was very dirty and dusty. I wandered about Liverpool for some time, but could not recognise any place I wanted, so thought I would go back the same way I came. I got on the car back to St. Helens; it was getting very late. I tried to get some sleeping apartment for the night, but it was so late I could not get in anywhere, so I thought I would still go farther on nearing A——n. I saw a kind of park (Haydock) with a railway bridge which looked a nice place for a shelter. I remember going to sleep, but before doing so I remember seeing two or three men in the park.

I can remember nothing else till I woke up [on Whit Tuesday, May 25th] and thought I would get some breakfast and go back to S——n. I had about 9*d.* in my pocket, knew I should want more, put my hand in my pocket for my wallet to get out another note, but could not find it. I looked where I had slept but could see nothing of it. I then stayed in the park for some time till I saw a party of ladies and children; they came up to me and asked what was the matter. I remember telling them I was not well; they asked me to have some milk, which I had, also something to

[1] I am indebted for this useful hint to Dr. Hadfield's article in Functional Nerve Disease.

eat. Towards night, knowing I had no money, I started to walk again; it looked so much like rain, and being tired I saw a chapel on the road. At the back there was a little washhouse. I went and sat in there for a time and had a sleep, then started walking towards Ath——n.

Before coming to Ath——n I went in a park close to and sat there for some time thinking and wondering where I should go. I found some food that had been left by someone and ate it, then went on to the library at Ath——n and stayed there for some time, then wandered about feeling very bad till I was found in Market-street about 12 o'clock [midnight, 26th–27th] and taken to the police station. They gave me some milk and questioned me, but could remember nothing. They then took me the next morning to —— Union. I remained there till my young lady and gentleman friend of mine came to fetch me [on May 29th], but could not recognise them, and went back with them by train to Manchester, but could remember nothing about the town, still having pains in my head."

The above statement accounts for the whole fugue, though, as before narrated, the events which transpired after he woke up in the park on the Tuesday morning to find his money gone had never left his memory. Z.'s story answers the question which naturally puzzled one at first, "If he on Monday sent the telegram to his fiancée, remembering her address, why had he not been able to return?" He definitely says that after sending it he went to sleep in the field and did not remember anything about the telegram when he awoke. Again, why did he on the Tuesday and Wednesday go back through the same towns he had passed through on Monday, since he had quite forgotten where he had been on the Monday? He told me that he "felt an impulse" to take that route, though he did not remember having traversed it previously. Thirdly, why did he "wake up" on the Tuesday morning so that subsequent events were remembered? His own theory, when questioned about it after his memory had returned, was that it was due to the shock of finding his money gone. It is more probable that on the corresponding morning in France in 1918 the danger of that particular series of air raids terminated, and this was subsequently confirmed by his recollection of that time and also by independent evidence. There seems little doubt that the men seen in the park late on Monday night took his money. He remembered noticing that they were a rough lot, but in his state of absolute exhaustion he went to sleep and remembered nothing till morning. It is possible that he fainted from exhaustion, for he had walked at least 25 miles on very little food since the Sunday morning, not including his wanderings all day about Liverpool. The comparatively large sum of money which he had with him represented the amount owing for the suit of clothes which he had arranged to fetch and pay for on the Sunday morning. It will be noticed that his objective was always among trees, and he finally came to a halt on the Monday night in a park near a railway bridge. He said that the combination of trees and railway gave him a sense of security. [Cf. his experience in France two years previously.]

By similar methods the memory of his past life was recovered and assimilated to consciousness, so that a complete history could be constructed. The missing tools were traced to a corporation parcels office where he had deposited them some weeks before Whitsun, and were recovered. Of the securities more anon.

History of Patient.

Z.'s family and personal history was good; no epilepsy or automatisms. Many years ago he had a bicycle accident, which rendered him unconscious but left no legacy of headaches or defective memory, and he was "as good a man as ever after it." Called up early in 1917, at the age of 40, he went to Etaples in August of that year and worked as a carpenter in an artisan company on hospital construction and similar work. All went well until he came in for an air raid at Easter, 1918, but the hostile planes did not come very near on that occasion. [At this point in the hypnotic recital patient shook and evinced other signs of emotion.] At Whitsuntide, 1918, there were very severe raids and the company's dining-hall was blown up, though, fortunately, it was empty at the time. In the early hours of Whit Sunday morning there was a very big raid, and patient was hit on the foot by a piece of shrapnel. He remembers going out of camp soon after to a small wood to find a safe place to sleep in, as he felt he dared not stay another night in camp. He was brought back and told that no one could leave the camp "on their own," but that a party would be organised every night, for those who wished it, to walk out to a wood some kilos away. Here were two railway lines, and he was told that a railway bridge was a safe place or, better still, against an embankment. A few days later proper dug-outs were constructed, and there was no need to retire to the wood. Z. experienced several other raids, which were chiefly during the week-ends. (The dates were verified from a calendar which he was able to obtain from a friend who had been with him at Etaples; this proved his memory of the events of that period to be very accurate.) The significance of these dates in connexion with subsequent events will be presently apparent.

Z. was always very apprehensive of raids and used to go to a dug-out or cave even when others did not consider it necessary to do so, thus gaining the soubriquet of "The Dug-Out King." One night he was leaving the hut and had to be stopped from doing so by the other men, whom he had awakened. He was aware of the occurrence and was not somnambulating, but felt compelled to go. Even till Christmas, 1918, weeks after the armistice, he felt this nervousness and restlessness at night.

Condition After Demobilisation.

Finally, in March, 1919, he was demobilised. He paid a visit to his brother in East Anglia, returning to Manchester just before Easter, 1919, after which he started business as a joiner. He resided with his former friends and rented a shop for his work.

During the ensuing year he was far from well. Although anxious to work, he felt unable to do so efficiently. His friends noticed that he was always worse at week-ends, when he frequently had to put off excursions which he had arranged with his fiancée. He was depressed and anxious and suffered constantly with "terrible" (sic) headaches. His memory was very defective. He also had a sense of impending disaster and a feeling that he must get "right away," though he did not know from what, and he had an ill-defined apprehension, which he knew was unfounded, that he would have to return to France. He felt he was not doing his work satisfactorily and was worried because he did not think he would be justified in marrying. He used to sit brooding in his shop and would often go out into the country for a day, thinking it would do him good and also because on these occasions he had a claustrophobia for his shop. This conduct appeared unreasonable to him, as he was ignorant of the reason impelling him to make these excursions; consequently he was ashamed to speak of them to his friends. This in turn led to his fiancée thinking he was not quite straightforward with her, which added to his unhappiness. He was only too conscious that his friends were watching his, to them, inexplicable conduct, and he became thoroughly miserable. He told me that during this period he feared for his reason, and, though suicide was not actually contemplated, he often wished he had been killed in France and was out of it all.

In addition to his general malaise there were several occasions when he was definitely incapacitated and went to his doctor. The most noticeable attacks were at Easter, Whitsun, July, August, and October, 1919, Easter and the three weeks preceding Whitsun, 1920. During the last period he was unable to work and consequently did not need the cloak-roomed tools. He felt too poorly to fetch them.

The relationship between these illnesses and events in France are shown in the following table, in which the dates of raids are verified by his friend's calendar and his illnesses from his own and his friend's statements:—

	1918.	1919.	1920.
Easter:	Air raid.	Unwell, went to his doctor.	In bed on the Saturday.
Whitsun:	Air raid.	Not fit.	Fugue.
July:	Raids 1st, 3rd, 13th, 24th, 31st.	Felt ill and went to his doctor.	
August:	Raids 1st, 10th, 13th.	Ill at Bank holiday.	
October:	Raid on return from leave at Boulogne.	Went to his doctor.	

On one or two occasions he suddenly collapsed face downwards, and on being picked up after one such attack asked "if he were in France." The events of Easter, 1919, may be briefly referred to because of their connexion with the missing securities. It was very difficult to recover the memories of these; he thought he had hidden them somewhere, but the only places at his legitimate disposal were his one-roomed shop and the house where he lived, so the choice seemed limited. Hypnosis, however, revealed that he had a vague recollection of taking them into the country and leaving them somewhere, but it was only after repeated hypnotism that the story could be pieced together. On Easter Monday, 1919, after an early visit to his doctor, as he felt ill, he felt impelled to take the papers with him into the country and took train for this purpose. At the end of the train journey he felt he must get still further away, so he took a vacant

seat in a charabanc which was bound for an historical part of Derbyshire. He left the charabanc and after walking some way through a wood, deposited the box in an ivy covered niche, subsequently returning to Manchester by train. A few days previously his brother had advised him to be very careful of the papers; it is therefore not surprising that when he went into the country feeling, perhaps subconsciously, that his own safety required it, he should have taken the securities with him. After hiding the papers he intended to fetch them, but forgot where they were; he felt that they were safe, however, and was accordingly easy in his mind.

Repression of War Memories.

Z.'s attitude towards his war memories was one of determined repression. All unpleasant memories were deliberately kept out of mind during the day and he gave the anticipated account of constantly repeated dreams of bombs and raids, together with a certain wood. This wood constantly recurred in his dreams, and was evidently the one near Etaples. Corroboration of the nightmares was obtained from the son of the house, with whom Z. shared a bedroom. Z. also made the interesting statement that at the times when he felt most ill he, in accordance with his friends' advice, made particular efforts to "forget" all about France, with the result that he noticed that his sleep was even more than usually broken by dreams and his headaches were much intensified. He used to wake with a start when dozing off, in a cold sweat and with his heart beating tumultuously. All this is quite in accord with the observations frequently made of the effects of repression, but the spontaneity with which he volunteered the information was striking. The battle dreams were particularly in evidence during the three weeks preceding the fugue and whilst he was in the infirmary.

Prior to the fugue he does not appear to have had amnesia for his army experiences, though his friends told him that his accounts did not always tally. It never once occurred to him that his wish to get away into the country, where he always sought a wood, was in any way connected with his conduct in France, where, it will be recalled, he was marched out at night to the woods of (?) La Foil and then felt safe.

Progress of Case.

After the first hypnosis on June 21st progress was rapid. Up to this, four weeks after the fugue, his memory had shown but little signs of returning, and it would be interesting to speculate as to what the outcome would have been had he had no friends to discover him and bring him for treatment.

Hypnosis was employed solely to recover the lost memory; to have used it to suggest that he would have no more fugues, without explaining to him how his illness had come about, would have been quite unjustifiable. The journeys into the country were his only means of escape, however inadequate, from his intolerable situation, and to block this safety-valve without showing him a better way out of his troubles might have had disastrous results, possibly even suicide. It was gratifying to hear him spontaneously relate how the weight of impending and unknown disaster which had been with him for so long was now quite lifted from his mind, and that he was sleeping well with no disturbing dreams. He volunteered the statement that an aeroplane which was one day near the hospital did not frighten him at all. He commented on this to his companions, because on previous occasions since leaving the army the sight of an aeroplane had always made him tremulous and nervous, even though his reason told him his fears were unfounded.

Stages in the Case.

The stages which culminated in the fugue were, therefore, first, the air raids, which affected Z. more than his colleagues. It will be remembered that he made for a wood on his own responsibility before the order was given for the men to sleep out, and he associated a wood, especially near a railway bridge, with safety. Then there was the episode of his feeling impelled to leave the sleeping quarters when he was stopped by his friends. Though not an unconscious act, it marks a stage towards automatism, as did his various excursions from Manchester. The Easter Monday occurrence was important in this connexion, since he afterwards entirely forgot where he had put the papers, though he remembered and spoke of the day's excursion, and, in fact, planned to make it again with his fiancée. The connexion between his malaise at week-ends and the air raids is obvious, while "the fits" of falling suddenly on his face were repetitions of similar acts in France. The baleful influence of repression was throughout responsible for maintaining and intensifying his condition. At first he could remember all the events of his army life, later his friends told him the accounts did not tally, and finally the memories became completely dissociated. Possibly even half an hour of psychotherapy 15 months ago would have spared him most, if not all, the misery of the past year.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF THE MYOCLONIC FORM OF ACUTE EPIDEMIC ENCEPHALITIS, WITH RECOVERY.

BY DOUGLAS MCALPINE, M.B., CH.B. GLASG.

IN THE LANCET of July 17th three fatal cases of the myoclonic form of acute epidemic encephalitis were reported by Dr. Arthur W. M. Ellis. The following case may prove of interest on account of the mildness of the attack and recovery of the patient.

A. T., female, aged 25, dressmaker, was seen in the out-patient department of Maida Vale Hospital for Nervous Diseases on June 10th, 1920, with a complaint of general nervousness and depression, insomnia, difficulty in walking, and twitching in her muscles. About May 17th she had pain in the back of her right forearm; this continued until May 23rd, on which date she went for a bicycle ride into the country. The same evening she felt a "drawing pain" on the right side of her chest, not aggravated by respiration. On the 24th the chest pain was associated with tenderness. The pain continued until the 27th, when she then felt it right round her body just above the waist; this only remained for about 24 hours. From May 24th onwards she had felt depressed and tired and had not slept at all; she thought she was delirious at nights—the latter two statements her mother confirmed. Her bowels were not open between May 24th and June 3rd. About May 30th she first felt sudden muscular spasms in both legs, chiefly in the thigh and calf muscles; each spasm only lasted a second or so. A few days later she noticed them in her abdomen. With the onset of these spasms the pain in her right side became much better. On June 4th, whilst walking, her knees frequently gave way; this has continued since that date; she thinks it is due to the spasms. Her mother stated that she had been slightly drowsy during the daytime, but patient denied having felt drowsy. No history of vomiting, headache, diplopia, or difficulty in voiding urine.

Examination in out-patient department.—Patient looks pale with an anxious expression. She talks quickly and excitedly, but there is no speech defect. Eyes are bright and staring. She answers questions intelligently. As she stands her knees give way suddenly from time to time owing to sudden momentary contraction of the hamstrings, usually bilateral. On examining the abdomen in the recumbent position sudden shock-like contractions are seen involving the lower segments, chiefly the left, causing the umbilicus to be pulled downwards. The tone of the abdominal muscles is slightly increased. Reflexes are present in lower segments, but absent in upper. A fine irregular tremor is present in both legs on voluntary movement. The same shock-like contractions are present in certain muscle groups in the legs—especially frequent are those in the peroneal group of the right leg and in the posterior group of the left leg. The contractions are much shorter in duration though just as powerful as those in the abdomen.

Earlier in the same week, owing to the kindness of Dr. George Riddoch, I had an opportunity of seeing one of the three cases reported by Dr. Ellis, and the similarity between the movements in that case and the one I was examining was so striking that I felt sure that this was a case of a similar nature. She was admitted into Maida Vale Hospital on June 12th, under the care of Dr. Anthony Feiling.

Condition on admission and subsequent course.—June 13th: M.T. 98·0° F., P. 88, R. 20. Patient states that she is very depressed and has considerable difficulty in moving in bed. Seems less excitable than on June 10th; no drowsiness; no disorientation. Constipation marked, bowels not acting since June 10th. Insomnia still present. Pupils moderately dilated; slight inequality, left being larger than right. Unsustained lateral nystagmoid movements. No strabismus or diplopia. Pupils react to light and accommodation. No facial asymmetry or other cranial nerve palsies. Fine tremor in outstretched hands; no ataxia. No sensory disturbance.

All movements in arms weak and carried out with apparent difficulty. No myoclonic movements. In the abdomen these movements are less frequent than on June 10th, occurring 2–3 per minute; left lower segment mainly affected. No reflex response can be obtained in upper abdominal segments; those in the lower segments are markedly slow, closely resembling the myoclonic movements. A general stimulus to abdomen is sometimes followed after a short latent period by a myoclonic movement of lower abdominal segments. The legs show a slight general weakness, especially distally. Hypotonia is present. No myoclonic movements observed. Fibrillary twitchings are present intermittently on plantar and inner aspects of left foot. Reflexes present in both legs, but are less brisk than normal. Bilateral flexor plantar response. No sensory disturbance. Urine: No abnormality; no difficulty in micturition. Heart and lungs negative.

18th: T. 99·6°, P. 120, R. 22. Still complains of general weakness and loss of appetite. Insomnia continues despite hypnotics. Semi-delirious during nights of 14th and 15th, but not since. She has not felt any more twitchings in her legs. No sweating. Frontal headache since 14th. Morning temperature 15th, 99·8°. Evening temperature remains normal. Pulse ranges between 100 and 120. Myoclonic movements less frequent in abdomen and vary in amplitude. Cerebro-spinal fluid clear. Cell count 15 per c.cm.; protein content not estimated. Wassermann reaction negative.

22nd: M.T. 98·8°, P. 100, R. 20. Feels slightly better; sleep has improved but little. Constipation still marked. This morning felt twitchings in her legs similar to previous ones. Since 18th there has been a morning rise of temperature to 99·4° or 99·6°. Normal temperature every evening. Pulse 92–112. Pupils still unequal. General hypotonia still marked. Myoclonic movements in abdomen, but none observed in legs. W.B.C. 7000. Differential count normal.

28th: M.T. 98·6°, P. 92, R. 20. Patient looks and feels better, but is still weak. On 28th she began to have shooting pains intermittently down back of both legs, especially left; her legs constantly ache and she says she does not feel as if they belonged to her. No more twitchings in legs. Bowels more regular; sleeping better. Temperature has been normal since 22nd, except for a slight morning rise on 25th and 26th to 99·2°. Pulse-rate still increased. Pupils more nearly equal. No nystagmoid movements. Abdominal reflexes are now present in upper and lower segments, but less brisk on right side than on left; still abnormally prolonged. Shock-like contractions occasionally seen chiefly in upper segments. Reflexes in legs remain the same except that left knee-jerk is more brisk; no plantar response can be obtained in right foot; no sensory disturbance in arm or legs.

July 2nd: M.T. 98·6°, P. 96, R. 20. Feels better. Reads and knits. No pains in legs for last two days, but still has aching sensation in legs. No headache. Myoclonic movements less marked in abdomen. No rise in temperature since June 28th. Pulse still rapid.

9th: M.T. 98·4°, P. 92, R. 22. Improving, less depressed. No pains. No muscular twitchings. Sleep is improving, but still restless at night. Pupils equal; no myoclonic movements observed in abdomen. Muscular power in arms and legs improving.

16th: M.T. 98°, P. 88, R. 20. Patient was up for half an hour in a chair on 12th and 13th, but felt shaky; also had pains down back of leg. Pulse quicker on 14th and 15th—i.e., 112 and 108—but pulse-rate was not observed to be more frequent than usual on returning to bed each day. For last 10 days skin of sole of feet has hardened and patchy desquamation is now taking place on her toes and on adjacent sides of distal phalanges in her hands. No myoclonic movements in abdomen observed—abdominal reflexes are present and equal in all segments but are still abnormal. In the legs reflexes are now normally brisk and both plantar response flexor in type.

19th, T. 98·4°, P. 104. R. 20. Feels stronger, appetite improving, sleeping better. Still has occasional shooting pains in both thighs. Also aching sensation intermittently. She has not been up since 16th owing to increased pulse-rate, which ranges between 88 and 100, but which remains regular. The patient is still under treatment.

Remarks.

The mildness of the attack in this case is of especial interest as contrasted with the very high mortality of the cases published in this country and in France. The initial pain, the insomnia and delirium, the marked subjective sensation of prostration, the constipation, the shock-like contractions most marked in the abdomen, a low-grade fever, and tachycardia are symptoms in this case in close accord with those described as part of the myoclonic form of acute epidemic encephalitis.

The following points are of interest in contrasting this case with those reported by Dr. Ellis:—

1. The inequality of the pupils and the absence of marked dilatation.
2. The absence of vomiting, difficulty in urination, disturbance in speech, leucocytosis, and sweating.
3. The presence of general hypotonia; this was a well-marked feature in the cases reported by Lereboullet and Foucart.[1]
4. The character of the abdominal reflexes.
5. The trophic changes in the feet and hands.

I am indebted to Dr. Feiling for permission to publish the case.

South Kensington, S.W.

A NEW METHOD IN RHINOPLASTY.

By GILBERT CHUBB, D.Sc., M.B.Lond., F.R.C.S.Eng.
ASSISTANT SURGEON, THROAT HOSPITAL, GOLDEN SQUARE; AND PLASTIC SURGEON, QUEEN'S HOSPITAL FOR FACIAL INJURIES, SIDCUP.

THE case described was a gunshot injury. The tip of the nose, the anterior part of the septum, and the whole of the columella had disappeared. The nasal bones were, however, intact, and the greater part of both alæ were present, lying flat upon the face. (Fig. 1.)

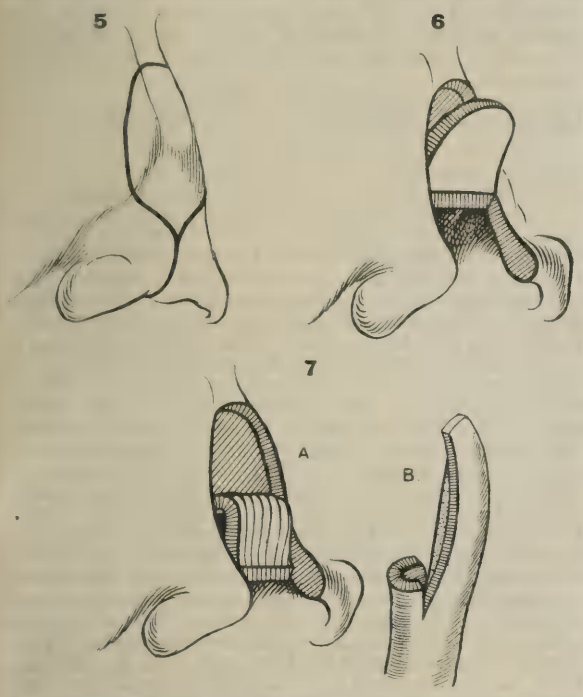
Photographs of Mr. Gilbert Chubb's case showing Re-formation of Nose by a Tubed Pedicle taken from the Chest Wall.

1 2 3 4

At the first operation a transverse tubed pedicle was made on the left side of the chest, immediately below the breast. The parallel incisions for this had a concavity directed upwards in order to prevent undue tension upon the pedicle in tubing. At a subsequent operation a piece of cartilage taken from the junction of the sixth and seventh ribs was carefully shaped to correspond to a plasticine reconstruction of the patient's nose and inserted beneath the skin at one end of the pedicle. Deep mattress sutures were employed to prevent its subsequent displacement pending the formation of fibrous adhesions to the surrounding tissues. The other end of the pedicle was then attached to the left forearm (Fig. 2, in which also the cartilage can be clearly seen at the upper end of the pedicle). Several weeks were now allowed to elapse in order to secure an efficient collateral circulation in the pedicle from this new attachment. At the next operation the pedicle, together with the cartilage implant, was released from the chest and attached to the nose. (Fig. 3.) Figs. 5, 6, and 7 illustrate the preparation of the

[1] Lereboullet and Foucart: Bullet. Mém. de la Soc. Méd. des Hôp. de Paris, 1920, xxxvi., 391.

nose for this attachment. A mesial incision (Fig. 5) separated the remains of the alæ from one another, and allowed of their being raised from the face. In the view of the nasal cavity so obtained can be seen the anterior limit of the remains of the septum. (Fig. 6.) A flap of skin outlined by the circular incision, seen in Fig. 5, was then dissected up and turned down upon its lower border as a hinge. (Figs. 6 and 7A.) The cut edge of the skin and mucous membrane lining the alæ and nasal cavity was defined, and the lower edge and sides of the flap carefully sutured to it with horsehair. Fig. 7A shows this inversion



of the flap nearly completed. The result is to complete the lining of the newly reconstructed nasal cavity, and completely shut it off from the wound. The free cartilage-bearing end of the pedicle was then trimmed as seen in Fig. 7B, so as to present two tongues, one long, bearing the cartilage and trimmed to fit the raw area left by the inversion of the flap, into which it was stitched. The shorter tongue was stitched to the lower border of the inverted flap and the intranasal lining of the cut tips of the alæ. In this way no raw area was left in the nose, the latter remaining dry from the operation onwards, and all healing being by first intention.

A columella was then formed from the outer portion of the upper part of the pedicle. The incisions for this purpose were carried up in a concentric manner over the tips of the alæ, so as to allow of the turning in of the columella and at the same time to bring the alæ forward into a normal position. All stitches were left long and untied, and the parts unapproximated until the last stitch had been inserted, thus ensuring as careful an approximation of the cut edges in what would finally be inaccessible regions as elsewhere. All stitches after tying were left long and tied together in a tassel issuing from the nares in order to ensure their ultimate removal.

Fig. 4 shows the patient several months after the completion of the final operation. During this interval the nose had undergone no change, and was as firm and "springy" as the normal organ. The rotation of the skin flap, in order to line the nasal cavity, and thus ensure against subsequent scar contraction, and the tubing of the larger flap are surgical methods extensively employed at the Queen's Hospital for Facial Injuries. The implantation of the cartilage on the chest and its elevation to the face by means of a pedicle borne on the arm has several advantages over methods previously employed. There is a complete absence of scarring about the face, neck, or breast, absolute symmetry can be maintained throughout the surgical treatment, and finally, the skin and cartilage implant can be got into a satisfactory condition away from the face before there is any interference with the latter.

Reviews and Notices of Books.

L'ANESTHÉSIE LOCALE EN OPHTALMOLOGIE.

By Dr. DUVERGER, Professor of Ophthalmology at Strasburg. Paris: Masson et Cie. 1920. Pp. 96. Fr.6.50

THIS little book will be found full of interest to the ophthalmic surgeon, and though all the views of the author may not receive general endorsement, there is no page which cannot be read with profit. With regard to the ordinary methods of cocaine anæsthesia there is little new to be said, but we note that for ordinary cataract operations the author prefers to rely on so strong a solution as 10 per cent., three instillations of which produce an insensibility that is complete. In the experience of most ophthalmic surgeons half this strength is sufficient for the purpose. The main interest and purpose of the book, however, is the description of the methods of deep injection for operations on inflamed eyes and for enucleation of the globe, as well as for operations on the lids and lacrymal sac. The solution employed for all these is novocaine, generally in a strength of 4 per cent. with a few drops of 1:1000 adrenalin added, of which 2 c.cm. are required to render the globe anæsthetic, or three if the eye is inflamed. The solution is injected deeply by means of a needle 3½ cm. long—sufficient to ensure its reaching the region of the posterior pole of the eye and ophthalmic ganglion without any danger of pricking the optic nerve. As in inflamed eyes the conjunctiva is acutely sensitive it is recommended that this deep injection should be made through the skin of the lower lid and continued between the inferior and external rectus. The outer zone of conjunctiva, which has its nerve-supply not from the ciliary nerves but from the nerves of the lids, can then be rendered anæsthetic by a subconjunctival injection of the novocaine solution. Similar detailed directions are given for rendering the skin anæsthetic for plastic operations on the lids and for extirpation of the lacrymal sac. The section on anæsthesia for advancement operations is worthy of note. The author finds the usual method of cocaine instillation unsatisfactory, and arguing that the sensitive nerve-supply of the muscles is from the ocular branch of the nasal, recommends the same technique of deep anæsthesia as for enucleation of the globe, or alternatively injections in the neighbourhood of the muscle, which, however, are not so effective.

For rendering the whole orbit anæsthetic more difficult procedures are called for. For Krönlein's operation a method is recommended for anæsthetising the superior maxillary nerve by piercing the spheno-maxillary membrane and injecting the solution into the pterygo-maxillary fossa. The author believes that the contra-indications to his methods are almost negligible and that they are destined practically to banish general anæsthesia from ophthalmic surgery.

THE AFTER-TREATMENT OF SURGICAL PATIENTS.

First edition. By WILLARD BARTLETT, A.M., M.D., F.A.C.S., and Collaborators. London: Henry Kimpton. 1920. In two volumes. Illustrated. Pp. 1066. £3.

THOUGH, as the author remarks, the need of after-treatment is, in many instances, in inverse proportion to the quality of work done on the operating-table, there certainly remains a great deal that can usefully be written on this subject. The surgeon will have his own methods which his experience has proved satisfactory; the house surgeon is working under supervision and will never be out of reach of advice when he needs it; and neither the one nor the other will often refer to any book on after-treatment except in cases of special difficulty which have not responded to ordinary methods, or when treating cases of uncommon diseases or after unusual operations. Therefore if such a book as this is to be of any real assistance it must give precise descriptions of all measures which may be useful in the treatment of both common and uncommon complications that may arise after any operation, and

actual details of the case of patients after special operations.

The two volumes satisfy these requirements to a very large extent. The various measures of post-operative treatment recommended are the results of the practical experience of the various authors, and others from whom they quote; they are described in considerable detail, and for the most part very clearly. The first volume deals with general subjects, such as sleeplessness, bed-sores, post-operative feeding, exercise, and massage. The second volume treats of methods of after-treatment that may be necessary following operations upon the various organs. The illustrations are well chosen and fairly numerous. There is a useful index, and reference is easy.

COMMON DISEASES OF THE SKIN.

By Dr. G. GORDON CAMPBELL. Lecturer on Dermatology and Pediatrics. New York: The Macmillan Company. 1920. Pp. 229. 21*s*.

Dr. Gordon Campbell has adopted a somewhat unusual method of dealing with skin diseases. He has written a volume of 229 pages on the common diseases of the skin, amongst which he includes 43 distinct conditions. They are dealt with in alphabetical order, and are very fully illustrated, whilst pathology is barely mentioned, and treatment dealt with in the briefest outline. The common disease, impetigo contagiosa, has no fewer than seven illustrations, four of which occupy a whole page each. Syphilis has 24 illustrations, 16 of which are whole-page plates.

From these examples the reader will realise that the object of the author is to show graphically the varieties of common skin maladies. In the majority of the illustrations this object is obtained, but in certain cases the student would be led astray. Pityriasis rosea has no fewer than four whole-page pictures, from none of which could a diagnosis be made apart from the letter-press. Sudamina and milium and several of the lichen planus and urticaria plates are equally unhelpful. In a book of this type fewer plates, all of an equally high standard, would better have served the student. The paragraphs on treatment, while brief and to the point, are of varying value. Psoriasis is summarily, acne and ringworm are fully, dealt with.

There is certainly need of a text-book conceived on Dr. Campbell's lines, but some modifications on the lines above indicated would appear to be advisable for a second edition.

MALARIA AT HOME AND ABROAD.

By S. P. JAMES, M.D., D.P.H. (Lieutenant-Colonel, I.M.S., retired). London: John Bale, Sons, and Danielsson, Ltd. 1920. Pp. 234. 25*s*.

IN this work the aim of the author "to provide an elementary guide to medical men and administrators who may have to deal with malaria at home or abroad during peace or war" is amply fulfilled. In it will be found a comprehensive and lucid account, not only of malaria from the clinical point of view, but of the life-history of the malaria parasite, the differentiation and distribution of the more important varieties of mosquitoes, and the various methods by which the breeding of mosquitoes may be combated and the incidence of the disease lessened in the malarial regions. The introduction of malaria into England by carriers from war areas where the disease is prevalent, and its spread among the local population, are fully described, and it is of special interest that, in the course of a malaria survey in Kent, cases were found that could not reasonably be ascribed to an origin from military foci, and which were regarded by the author as probable examples of indigenous malaria. Attention is drawn to the frequency of latent infections, in some of which the earliest clinical manifestations had been delayed for a period of several months subsequent to demobilisation. Exception may perhaps be taken to the statement that the greater number of the Macedonian infections were with both benign and malignant tertian parasites; cases of double infection were doubtless common in Macedonia, but that they constituted anything approaching a majority of the total number of cases is contrary to the impressions formed by those who were working on the spot. On the vexed question of quinine administration in blackwater fever the opinion of the author that, with parasites present in the blood at the beginning of an attack, quinine should be withheld, will not receive unanimous endorsement. The publication of this work at the present time is especially opportune. The subject-matter is well arranged and the text is supplemented by a large number of excellent illustrations and diagrams. The terse and graphic style of the author greatly adds to the interest of the book, which should be read by everyone concerned with malaria and its problems.

LECTURES ON INDUSTRIAL ADMINISTRATION.

Edited by B. MUSCIO. London: Sir I. Pitman and Sons, Ltd. 1920. Pp. 276. 6*s*.

THE science of medicine passed during the nineteenth century through a period of precision; life was looked upon as precise chemistry, none the less precise because complicated; pharmacy presented drugs to cure and remedy most variations from health; even the microbic origin of certain diseases only concentrated attention the more on the laboratory as the place to study diseases; materialism ruled, and the teaching of our great forefathers was almost neglected, that for health of body health of mind was necessary. From this stage we are now emerging, and no sign of the change is more pronounced than the increasing attention devoted to-day to psychology. We meet it at every turn. It has found a profitable field for expansion in the rapidly developing science of industrial health, where the social life and mental outlook of the worker is inseparably bound up with his health and sickness.

There has just been published a selection of lectures delivered at the Cambridge Psychological Laboratory dealing with industrial administration. Here we find meeting on common ground persons whose interests otherwise are as poles asunder—Professors Myers, Cullis, Sorley, Pear, Collis, Messrs. Wrong, Stelling, Burt, Wyatt, Fleming; philosophy, engineering, social economy, psychology, physiology, medicine, all are represented, each benefiting by contact with the other. Professor Sorley deals with ethical aspects of industry; he claims a man should give an equivalent for what he gets, and the employer "a fair day's wage for a fair day's work." And further aptly says: "It is good to feel tired sometimes, though it is not good to feel tired all the time. Nothing great has been accomplished without toil." Mr. E. M. Wrong discusses some tendencies in industry, and claims that industry must discover some more satisfactory method of responsible government than at present exists. Management must become a learned profession; and managers must recognise their duty is to deal with the psychology of men, rather than the physics of materials. Expert advisers, engineers, and chemists should deal with technical problems. Managers to-day are over-busied with many things and do not study labour enough or carry out scientific observations upon the human material they have to control. Mr. A. R. Stelling explains the principles introduced by Dr. Frederick Taylor, and points out how failure has followed part adoption of these principles, with omission usually of those which concern the psychology of the workers. The impersonal factors are adopted, the personal neglected. The right way to follow out motion study is explained, and the necessity for humanity in works management is pointed out. Mr. Stelling holds that Taylor's theories are practicable in this country, providing a complete solution of the problem of the increase of production. Mr. Cyril Burt treats of vocational selection of workers, an entrancing and comparatively new subject in which mental and physical attributes come together for study. Here individual psychology, "the youngest branch of the youngest of the sciences," is invaluable. Vocational selection not only pays, but is a measure of social justice. This lecture is one of the best in the volume. Mr. Wyatt deals with an interesting side line, the psychology of advertising.

The reader after perusing it will ever after pay more attention to the advertisement-covered hoardings. Professor T. H. Pear carries us into the realm of abstract psychology, and we frankly confess the expedition does not grant much knowledge for practical daily use.

A discussion of industrial overstrain and unrest by C. S. Myers, on the other hand, though at times abstruse, will appeal more to our profession. He deals particularly with fatigue, and claims that "the pathological expression of fatigue—i.e., overstrain—is far less prevalent in muscular than in mental exertion." He puts in a plea for an organised whole-time industrial medical service of physicians specially trained after graduation, comparable to that in existence for the maintenance of public health; and for the establishment of industrial clinics and sanatoriums. Professor Winifred Cullis writes on women in industry, a subject peculiarly her own; hard work should not if under good conditions exert a harmful effect upon a woman, nor will it interfere with the function of child-bearing. If fundamental physiological facts are borne in mind "women who wish to remain in industrial employment should be able to do so with benefit both to themselves and to their employers."

The way in which needed health reforms in industrial management can be instituted is dealt with by Professor Collis, who holds that "modern industry wrought by progress on the anvil of utility is a tool intended for welfare." Welfare departments in factories with supervisors, doctors, nurses, and dentists are strongly advocated to remedy the complaint put forward by workers that "their hours should be so long and their wages so small, their lives so dull and colourless, and their opportunities of reasonable rest and recreation so few." Interesting details as to personnel and duties to be undertaken are given from the experience of the Ministry of Munitions. The book concludes with lectures by Mr. Fleming and Mr. S. Florence on the need for and the methods of carrying out industrial research. It is readable throughout, and contains information with which every industrial medical officer should be familiar, and be glad to have it at his disposal.

A ST. HELENA WHO'S WHO.

A Directory of the Island during the Captivity of Napoleon. By ARNOLD CHAPLIN, M.D. Cantab. London: Arthur L. Humphreys. 1919. Pp. 257.

EVEN the smallest or most trivial occurrence connected with Napoleon is of interest, and although Dr. Chaplin's book is mainly a chronicle of trivialities, it is well worth reading as a record of the people among whom a great man and a fallen Emperor passed the last years of his life. Dr. Chaplin has managed to collect details of apparently everyone who was resident in the island during the captivity, from Sir Hudson Lowe down to the odd job man at Longwood. And society in general seems to have much resembled that described by Mrs. Sherwood in the "Fairchild Family" and "Little Henry and His Bearer." There was a worldly and, to put it mildly, none too moral a section, while another section was severely Evangelical, and used to offer up nightly prayers for the salvation of Napoleon's soul. Slavery existed, but was finally put down by the H.E.I.C., with the voluntary agreement of the island and at the instigation of Sir Hudson Lowe, in 1818. One of the most interesting personalities on the island was the Rev. Richard Boys, senior chaplain. He was a divine of extremely rigid and uncompromising views, one, in fact, who would have been the delight of the Dowager Countess of Southdown, and whether from desire of Heaven or from fear of Hell, the morals of the island underwent a vast improvement from his efforts. Thus, in 1813 the illegitimate baptisms were 198; in 1815, when Mr. Boys was appointed, they fell to 58; in 1820 they were 17. During the years 1822–1825 the island underwent a religious revival owing to the exhortations of Mr. Boys, and the numbers for these four years were respectively 6, 3, 4, and 7. He was obviously tactless and narrow-minded, but absolutely fearless in doing what he believed to be right. In July, 1821, a few days before the departure of Lowe and his staff, Boys preached a sermon which gave rise to much surprise among its hearers. No copy of the discourse is extant, but Lowe was so much struck by it that he made a careful analysis of it, which he submitted to the Council on the day following. Lowe's précis will be found in Dr. Chaplin's book. The text was, "Verily I say unto you, that publicans and harlots go into the Kingdom of God before you," and the sermon was evidently of the kind which made Lord Melbourne say, after hearing a similar discourse, "Things have come to a pretty pass when religion is allowed to invade the sphere of private life." However, the indomitable Mr. Boys, after coming to grips with the Council, retained his position until 1830, when he retired on a pension, and we think that the Council deserves credit for its attitude towards him, having regard to contemporary modes of thought.

Dr. Chaplin's last chapter brings to mind those romances of our boyhood which always left off at a critical juncture—e.g., "At this moment the arras parted and the figure of a monk appeared who bore a knotted whip." For Dr. Chaplin mentions the fact unknown to most people that besides the Lowe papers in the British Museum there exists in the custody of the Court of Chancery a large collection of documents left by Major Gorrequer, military secretary and A.D.C. to Lowe, nearly all of which deal with the captivity, including Gorrequer's private diary. In 1855 these were considered by Gorrequer's executor to be too secret and confidential to publish, and in 1881 Mr. Vice-Chancellor Bacon made an order for these documents to be kept by the Court. At this date, however, we should imagine that no one's feelings would be hurt by their publication at least in part, and as they are probably of extreme interest it may be hoped that the information contained in them will see the light. In the boyhood's romances the promise of "to be continued" was always kept.

A PRACTICAL TREATISE ON OPHTHALMOLOGY.

By L. WEBSTER FOX, M.D., LL.D. London and New York: Appleton and Co. 1920. With 6 coloured plates and 300 illustrations. Pp. 831. 35*s*.

IN the main this work follows the lines of previous text-books. The author's claim that in this new edition he presents all the modern thought and practice of ophthalmology can hardly be allowed. No ordinary text-book could possibly do this, nor is it desirable that it should. Take glaucoma, for example. Its pathogenesis opens up wide problems whose solution is yet to seek, and the same is true of most forms of choroiditis and retinitis. A text-book should give some idea as to what these problems are, but can hardly be expected to give all the various attempts at solution which different authorities have proposed. Similarly with regard to the operative treatment of conditions, where many alternative operations are possible selection is indispensable.

So far as it goes, this book is a reliable guide for the student. The ophthalmic surgeon will be chiefly interested in the description of an original operation for conical cornea, and perhaps in an original illustration showing colloid growths of the retina. The Elliot operation for glaucoma which is now well established is described by Colonel Elliot himself in an appendix, but it is a pity that the description is not accompanied by illustrations. The general get-up of the work, the print and style of illustrations, are all that can be desired.

THE PILGRIM'S BOOKS.

No. 2: Toasts, Rakes, and Cits. London: Philip Allan and Co. 1920. Pp. 256. 5*s*.

THIS little collection consists of papers from the *Tatler*, for the most part written by Addison and Steele, although some few are by other hands. They have been selected so as to show modes and manners, mainly urban, in the eighteenth century. Talleyrand said that no one could form any idea of how pleasant life could be who had not lived before the French Revolution, and certainly the life depicted in eighteenth-century light

literature paints a most graceful and happy existence for the upper and even for the middle classes. As for "the swinish multitude," they certainly had more of the hardships of life than anything else, but they enjoyed themselves hugely in a coarse and somewhat brutal manner, and apparently there was nothing like the unrest which is so obvious to-day. The curious thing about the eighteenth century was the admixture of coarseness with extreme refinement. Think of Swift's picture of society as drawn in his "Polite Conversation" in his poem describing a lady's bedroom, and of the incidents described by Lord Robert Seymour in his diary, and compare these with the grace of the dress, the outward show of courtesy and dignity in manners, the art of Gainsborough, Reynolds, Romney, and Cosway.

To read the *Tatler* and *Spectator* is always a delight, and this little book will be a pleasure to many who have not the time or the energy to read the somewhat voluminous originals. One paper, that on p. 217, entitled "Dr. Young," is of special interest to our profession as giving an amusing picture of a quack.

JOURNALS.

Journal of Pathology and Bacteriology. Vol. XXIII., No. 3. Pp. 241–370.—The Cultivation and Isolation of *Bacillus tetani*, by R. S. Adamson. To isolate the tetanus bacillus from septic wounds the author recommends culture in alkaline (– 10 or – 20) broth, either anaerobically or aerobically with *Bacillus proteus*. These mixed cultures give good yields of toxin, and any suspected culture should be grown for 4 to 8 days and then inoculated into a guinea-pig.—The Biochemistry of *Bacillus œdematiens*, by C. G. L. Wolf. Exact analysis of cultures shows that this anaerobe is both proteolytic (like *B. sporogenes*) and saccharolytic (like *B. welchii*).—The Influence of Glycerine on Certain Streptothrixes Isolated from Malignant Growths, by A. S. and H. G. Leyton. Three strains growing white on plain agar produced abundant yellow pigment on the addition of glucose and glycerine.—On the Antitoxic Content of Some Gas Gangrene Sera Used in the Later Stages of the War, by H. Henry.—The Precipitation of *B. welchii* Toxin, by H. Henry and M. Lacey. The toxin of *B. welchii* reaches its highest value in meat-broth cultures in 12–24 hours and thereafter rapidly depreciates; it is also inconveniently unstable in the filtrates from such cultures. The highest potency is also relatively small, a good preparation containing no more than 10 mouse minimal lethal doses per c.cm. A stable concentrated toxin may be obtained by precipitation by ammonium sulphate or alcohol, and best by dissolving the precipitate obtained by two-thirds saturation with ammonium sulphate in water and reprecipitating by the addition of four volumes of alcohol. This is very useful both for immunising horses and for titrating their sera and keeps without deterioration.—The Anaerobes Responsible for Gas Gangrene in Man, by H. Henry and M. Lacey. The isolation and identification of the anaerobic bacilli from cases of gas gangrene is very difficult. The authors have used guinea-pigs protected against one or more species by a preliminary injection of specific antitoxic sera; the animals then act as differential filters, allowing those organisms only to grow and invade the blood against which they have not been immunised. In 50 consecutive cases examined in this way *B. œdematiens* was found five times and *B. fallax* twice, the rest being *B. welchii* or *Vibrion septique*.—A Comparative Study of Experimental Bilharziasis in Monkeys contrasted with the Hitherto Described Lesions in Man, by N. H. Fairley. The original must be consulted for this valuable description of the symptoms and anatomy of monkeys infected in Egypt with *B. mansoni* and *B. hæmatobia*, which throws much light on the human disease and on the differences between the two parasites.—The Fate of "Washed Spores" on Inoculation into Animals, with special reference to the Nature of Bacterial Toxæmia, by F. H. Teale and E. Bach.—The Relation Between the Quantity of Serum Administered and the Active Immunity Produced in the Simultaneous Vaccination against Hog Cholera with Virus and Serum, by T. B. Haslam. Large quantities of serum do not interfere with active immunisation.—Spirochætal Jaundice: the Morbid Anatomy and Mechanism of Production of the Icterus, by J. W. McNee. From a study of five fatal human cases and experimental guinea-pigs, the author concludes that the jaundice is due to destruction of liver cells and not to excessive hæmolysis or biliary obstruction as has been supposed.—A Saccharomyces in Mesenteric Glands of the Human Body, by T. Tanaka.—Comparison of Structures of Red and White Cells, by E. Emrys-Roberts. Reflections on the fact that leucocytes shrink on drying in a different way from red cells.—A New Pathogenic form of Streptothrix, by A. G. Gibson. Isolated from a spleen excised from a case of acholuric jaundice.—Variation in Bacteria in Relation to Agglutination by Salts and Specific Sera, by J. A. Arkwright. Cultures of Shiga's dysentery bacillus and other organisms yield two forms differing widely in their agglutination reactions and mode of growth.—A New and Simple Criterion of a Positive Wassermann Reaction based on the Analysis of over 2000 Quantitative Tests, by C. H. Browning and E. L. Kennaway. If the amount of complement giving just complete lysis with the negative control serum is reckoned as 100, any serum giving complete lysis with 200 complement or more is positive, those taking 150 or less negative and the rest suspicious.—The Specific Relationship of Heterogenetic Antibodies to Certain Tissue Lipoids, by T. Taniguchi. The injection of guinea-pig organs into rabbits gives rise to immune body for sheep red corpuscles in the latter's serum; alcoholic extracts of the antigen can inhibit the immune body.—A Source of Fallacy in the Wassermann Reaction depending on Heterogenetic Antibody in Human Serum, by T. Taniguchi. Human serum not infrequently contains heterogenetic sheep hæmolysin; it is therefore not safe to use alcoholic extracts of heterogenetic antigens (guinea-pig or horse heart) in the Wassermann test.

In the *Journal of the Royal Army Medical Corps* for July Captain S. H. Daukes tells how many were the schools, how valuable the courses in military hygiene that were required during the war to provide R.A.M.C. officers and men to fill the sanitary sections which kept the armies on the various fronts free of preventable disease. At Chelsea, Leeds, and Blackpool the schools each did a great work for the war, and we hope their influence is still active in the country now the troops have come back. The story is one that all should read to learn how much a skilful civil practitioner must acquire before he is fully efficient as an army officer.—Captain F. E. Reynolds reports from Baku that agglutination of proteus vulgaris emulsion in 1/100 dilution (Weil Felix reaction) is evidence that the case concerned is one of typhus fever, also that negative results during the second week of a pyrexia exclude acute typhus fever as a diagnosis.—Lieutenant A. W. J. Pomeroy describes how he materially reduced mosquitoes and malaria at Dar-es-Salaam in German East Africa. The Germans had decided to fight malaria here by quinine only, the destruction of mosquitoes being, it was thought in 1912, too large an enterprise. Lieutenant Pomeroy, who was entomologist in South Nigeria, thinks it is better to abolish mosquitoes by doing away with their breeding grounds. He had 50 natives permanently at work, sometimes 200. They drained the swamps, cleaned up the house-yards, oiled the waters he could not drain, put fish in the drains to eat the larvæ, and kept cattle off the swampy grounds, as their footprints made troublesome breeding places. As stegomyia and culex were diminished as well as anopheles, the town became more comfortable as well as healthier. Ointments are little good to keep mosquitoes away; that most recommended is made of equal parts of soft soap, paraffin, and eucalyptus oil.—A very suggestive lecture on Gas Poisoning, given by Dr. C. G. Douglas at the Royal Army Medical College, is reported. The Germans used four kinds of poison gases: (1) acute lung irritants, "green cross," chlorine, phosgene, &c., causing acute pulmonary œdema; (2) lachrymatories, as xylyl bromide; (3) vesicants, "yellow cross," mustard gas, scorching and blistering skin and mucous membrane—the necrosed mucosa might become secondarily infected, when broncho-pneumonia might follow and cause death; (4) sensory irritants, "blue cross," chlorarsines, acting on the mucosa of the respiratory tract causing burning and aching pains, nausea, and mental depression. At first gases came drifting over in clouds, later in shells, or from projectors which discharged gas in great volume over a restricted area, securing a high concentration. Against the earliest attacks we had no protection; later, with an effective respirator and good discipline, casualties and fatalities decreased. In the last 15 months of the war the army had 160,526 gas casualties (14 per cent. of the total casualties experienced), and of these only 2·5 per cent. died. Four-fifths of these 160,526 were due to mustard gas. Those badly gassed with chlorine were apt to develop acute pulmonary œdema and to die within two days. Such cases could not be allowed to walk; they must be carried on stretchers, and their great number at one time made tremendous difficulties for the bearers. Mustard gas caused casualties rather than fatalities, and if men wore their gas masks few died. Gas attacks were terrifying—the numerous casualties occurred so suddenly. As time went on the period under treatment was always being shortened, particularly in France. There were few sequelæ; the most common was the "irritable heart syndrome," shown by Haldane to be largely neurasthenic. It follows that gas poisoning should be treated near the front, for cases took months to recover in England against weeks in France—a serious thing. Not only were the men wanted in France, but their unnecessary care in England absorbed equipment and workers.

THE LANCET.

LONDON: SATURDAY, AUGUST 14, 1920.

The L.C.C. and the M.A.B.

THE embarrassing position of London in matters of health administration has always been recognised by those who study local organisation, and the problem of developing, and where necessary remodelling, that administration, when the health of so vast and heterogeneous population is concerned, is admittedly one of unending difficulty. The existing position of the Metropolitan Asylums Board, and the proposals that were recently made by the London County Council for its modification, form a very good example of the complexities that have to be unravelled before arriving at a working plan, and of the unlikelihood that any plan should escape criticism.

A report was submitted recently to the London County Council by its Special Committee on Health Administration, dealing with the organisation of health services in London. A general survey of health administration in London had previously been prepared by the Clerk and the Controller of the Council,[1] and armed with this information the Special Committee defined the general lines upon which the organisation of London health measures should be developed, if those lines were to be elastic in character, so as to allow for adjustments and alterations when brought about by the requirements of new legislation. The report of the Special Committee followed the general objective of the Ministry of Health Act, 1919, in that its scheme aimed to bring all the health services concerned under a unified control. The development of these services, as set out in the report, which should be studied, showed the responsibilities of the London County Council for local sanitary work, for the treatment of infectious disease, and for the provision of school medical service, while the relations of the Council towards the treatment of the insured were described, as also the measure of coöperation extended to various voluntary health organisations. The difficulties and anomalies in this congeries of health services were categorised and the existence of overlapping and deficiencies honestly stated; and a series of recommendations were arrived at. These recommendations, which together with the report received the endorsement of the Council, proposed that the health functions of Poor-law authorities should be divided between the Council, the City Corporation, and the Metropolitan Borough Councils in accordance with the MACLEAN Report,[2] and that the administration in London of future health services should be similarly entrusted, the Council being the central organising authority. It was further recommended that the Council should have power to appoint a Health Committee composed of its own members and of experts, to whom the various duties accruing under the scheme could be referred. The cost was allotted in particular ways, it being advised that the cost of the prevention of infectious diseases should be borne equally by national and local funds. The scheme of the Special Committee of the London County Council made particular reference to the Metropolitan Asylums Board, as possessing an "anomalous constitution" under which it had "certainly performed its duties very efficiently." Further, it assumed that "the institutions of the Metropolitan Asylums Board and its highly competent staff would be transferred *en bloc* to the Council," it being at the same time "desirable that the Council should have the benefit of the experience in hospital management of the members of the Board." The Council and the Metropolitan Asylums Board have always worked in friendly coöperation, but the latter body is not appointed by direct election, and while the Council determines the amount of accommodation which it asks the Board to provide for the infectious sick and other purposes, the Board makes the provision without control by the Council of the expenditure, and the cost falls on the poor-rate. The expenditure is thus jointly determined by two bodies, neither of which is in the position to control it.

There certainly seems room here for change, and the design of the London County Council was referred by the Metropolitan Asylums Board to its General Purposes Committee, which was asked to report on the new proposals of the Council for the administration of the health services of London in so far as the constitution and duties of the Board were affected. This report[3] constitutes a reasoned decision on the part of the Metropolitan Asylums Board not to seek inclusion in the scheme of the London County Council. The report recognises the cordiality of the references made to the work of the Board, while pointing out that the Board might have been consulted before the scheme was drawn up. The essential criticism of the report of the Board upon the scheme of the London County Council is that it goes at the same time too far and not far enough. The General Purposes Committee of the Board affirms that such an authoritative inquiry as that proposed by the London County Council should be undertaken by the Government, and that London health administration should therein be considered as a whole. Extension of boundaries, the constitution of a Central Council with local legislative powers, and the relations between this legislative council and administrative departments should, it considers, be settled before important changes in individual branches of medical services are made. Pending such a Government inquiry it recommends that, as far as the Metropolitan Asylums Board is concerned, the present needs can be met by the London County Council and each borough council being afforded representation on the Board, whose name, it states, should be altered to some style conveying its duties. Certainly no one would guess from its name that the Board provides hospital accommodation for infectious sick as well as for certain classes of sick children, defectives, and tuberculosis subjects, while con-

[1] Council's Publication No. 1979. Price 1s. P. S. King and Son, Ltd., London.

[2] Report of the Local Government Committee appointed by the Minister of Reconstruction on the Transfer of Functions of Poor-law Authorities in England and Wales, Dec. 19th, 1917.

[3] Metropolitan Asylums Board: Report of the General Purposes Committee *re* Prospective Legislation, July 31st, 1920.

trolling an ambulance service and training ships. The report of the General Purposes Committee of the Metropolitan Asylums Board is an interesting criticism of the virtues and vices that may underlie centralisation. There are 50 residential institutions under the care of the Board, in which there may generally be found some 16,000 patients and a staff of 9000. The business of the Board—its works, finances, and supply arrangements—occupy the time and energy of 73 members, and it is by the personal interest of a large body of representatives giving a large proportion of their time to the special work that the welfare of the persons is secured. Absorption into the London County Council would probably result in a diminution of the personal services given by representatives for whom there would be no place on the County Council, and who might not desire or would have no opportunity to take part in the general work of the Council. This might be only a temporary occurrence, but we have here none the less a strong argument for devolution to be set against the known merits of centralisation, while we must remember that one of the merits of centralisation is not necessarily economy.

A Census of Cripples.

EVERY social worker in the large cities of this country is struck by the high proportion of physical defects among the children in the poorer areas. Some idea of the number of cripple children in London may be gained from a study of Dr. W. H. HAMER's recent annual report as school medical officer for the metropolis. During the year 1919 the number of new cases deemed suitable to attend schools for the subjects of physical defects—termed in the report "P.D." schools—was 1184, namely 638 boys and 546 girls. And further analysis showed that 203 of these children were the victims of infantile paralysis, 52 of cerebral and 17 of other paralyses; 317 others were crippled as a result of non-pulmonary tuberculosis, 61 from congenital and 68 from post-natal deformities. No one supposes that these figures in any way cover the sum of deformed childish bodies in the metropolis. Rickety manifestations were actually found in over 3 per cent. of boys on entering the public elementary schools, and among older school-girls 2·7 presented deformities of some kind, chiefly spinal curvature. A few years ago Sir GEORGE NEWMAN estimated the total number of cripple children in England and Wales as between 30,000 and 35,000. The number is sure to be below the mark, for the lusty child is not a gentle critic of physical defect in his brothers and sisters, and the cripple child is liable to court obscurity.

It is therefore not a small service on the part of the recently formed Central Committee for the Care of Cripples that it is carrying out a house-to-house inquiry in certain typical rural and industrial areas, in order to obtain an accurate census of physical defect. A similar census taken in Cleveland, Ohio, in 1915–16, and another by BIESALSKI for the whole of Germany in 1906–08, revealed a hitherto unsuspected prevalence of disability. For the Cleveland inquiry, cripples were defined as persons handicapped from lack of the normal use of the skeleton or the skeletal muscles. The inquiry was carried out by a voluntary association employing unskilled visitors to make a house-to-house visitation, and experienced visitors to fill up the forms. An endeavour was made to ascertain in advance the number of cripples by asking for returns from associations engaged in health or social work, hospitals, ministers, and others; but the actual visiting led to the discovery of 65 per cent. more crippling than was known to all these agencies. In the German inquiry the definition of cripple was much more exhaustive—namely, "an invalid (in consequence of hereditary or acquired disorder of nerve, bone, or joint) deficient in the use of his body or limbs to an extent which makes it impossible for him in the social environment in which he finds himself to direct his remaining bodily and mental capacities towards the achievement of complete economic independence without the help of an institute which offers him combined facilities for medical treatment and education." The work was carried out by postal inquiry and covered the whole of Germany. Extremely full and detailed forms were issued, containing a large number of questions as to any possible crippling physical defect, the householder being legally compelled to furnish replies. A thorough analysis of the returns—excluding Bavaria, Baden, and Hesse, which did not reply in time—appeared in 1909 in book form.[1] The census now in progress at home is not only giving a similar basis on which to apply preventive and curative measures, but is awakening in the localities chosen an interest in their own quota of defect and the provision made for dealing with it. The honorary secretaries of this Committee are Miss BEASLEY, Mrs. TOWNSEND, and Mr. G. R. GIRDLESTONE, F.R.C.S., and any inquiries or information will be welcome at 20, Berkeley-street, London, W. 1. Naturally, action is not to be limited to ascertaining the extent of the problem, but the Committee has wisely decided not to interfere with the work of any existing agencies concerned with the care of cripples, but rather to assist and coördinate their efforts and to help any local authority or voluntary organisation desirous itself of making better provision for these children.

And there is a special reason for an effort on behalf of cripple children at this particular juncture. Experience gained during the war has brought out the value of expert orthopædic treatment for many injuries and physical disabilities that would formerly have been left unrelieved. Orthopædic departments of general hospitals and special orthopædic hospitals in Poor-law and other buildings have been dealing daily with scores of cripples and potential cripples, the result of the injuries of warfare. Some of these hospitals, with their teams of experts and admirable equipment, have been dismantled, and others will follow suit as the supply of war cripples in need of surgical help and training gradually diminishes. It would be lamentable if the opportunity were not utilised to tackle the problem of the child cripple. For it must be remembered that every cripple left without proper treatment and education means one more useless member of society, unable to earn an adequate livelihood, and yet for the most part with undiminished prospect of length of days. Before it is too late we urge on those who are at the focus of administration not to let slip an opportunity of turning the experience of war into the kindly fruits of peace, one which may never recur in our generation.

[1] Umfang und Art des jugendlichen Krüppeltums und der Krüppelfürsorge in Deutschland. Hamburg und Leipzig. Verlag von Leopold Voss.

Annotations.

"Ne quid nimis."

WORKING OUTPUT.

THE reports of the Industrial Fatigue Research Board as they increase in number are forming a special literature which is throwing light on the working of the human machine, and which cannot fail in time to display how health may be maintained and how early manifestations of disorder may be detected. The publications fall naturally into various groups as they deal with general topics or with this or that industry or group of industries. The most recent report,[1] one by Dr. H. M. Vernon, belongs to the former category and deals with the rate at which the effect, as measured by output, of shortening or lengthening hours of employment is manifested. The subject is one of considerable interest to-day, when hours of work are being curtailed in nearly every branch of industrial activity, and employers are eager to know whether to expect as large an output as before, and if so, how soon.

Dr. Vernon brings together data, some of which have been scattered through other publications referring to various trades, issued during several years. Information is thus drawn from the manufacture of steel, the tinplate industry, and the production of shells. Certain conclusions are arrived at as the result of comparing the statistical data quoted, conclusions which are of interest not only to the industrial economist, but also to the student of the metabolic activity of health. Dr. Vernon finds that when hours are shortened work at first proceeds for several weeks at the old rate—that is to say that there is a marked latent period, unless some incentive to more rapid work is placed before the workers. Then the workers, apparently quite unconsciously, begin to work faster as they find the energy at their disposal is greater than what they are expending. "They unconsciously speed up a little from time to time, and in that they suffer no over-fatigue in consequence, they get into the habit of working steadily at a higher level of speed. From this level they make further unconscious attempts to speed up, till they finally arrive at an approximate equilibrium of speed in relation to their hours of work." The increase continues to operate in heavy and complex processes, such as open-hearth steel melting, through as long a period as 12 months before a new and higher level is settled down to; in simpler operations, such as those of fuse-making, the new level may be attained in four months. Intermediate periods may be expected to elapse in the case of less heavy or less simple processes. In other words, the speed of human activity is a function of the weight of work and the period of employment, and there is a tendency for the expenditure of energy to be the same whether the hours be long or short. Dr. Vernon further points out that with long hours a certain proportion of the energy available is expended in "passive work" rather than in productive work, where passive work is held to include standing about doing nothing which in itself will finally cause fatigue; but when there are shorter hours this energy is saved and can be diverted into productive work. The result upon speed produced by lengthening hours is of even more practical importance to employers than that of shortening hours, owing to the use of overtime. Here Dr. Vernon finds little or no latent period before the rate of output accommodates itself to the longer hours. Any attempt to continue work at the pace suited to shorter hours would use up the available energy and leave none for the overtime hours unless reserves were called upon and the realms of over-fatigue invaded. We find here a scientific explanation of the saying, "overtime does not pay." The suggestion is put forward that when overtime becomes a necessity the additional hours should be spread evenly through the week, for example, it would be better to work nine hours each day instead of ten hours on alternate days. The resulting rate of work would then be that suited to a nine hour day; while by working ten hours on alternate days, the rate of work for every day of the week would become that suited to a ten hour day. Further, when overtime is no longer needed, a shorter period would elapse in recovering to an eight hour pace from a nine hour pace than from a ten hour pace. Evidence is also adduced to show that more time is lost on heavier work than on lighter work, and during longer hours than shorter hours. Thus women employed on rather heavy work lost 6·7 per cent. of time, as contrasted with women on rather light work, who lost 4·2 per cent.; while men employed for 63¼ hours per week lost 11·8 per cent. of time as contrasted with 6 per cent. when working 54 hours per week.

These facts suggest that there is a certain amount of energy at the daily disposal of the human machine; that there is a definite urge forward to expend this energy, an urge due to the anabolic activity of rest stimulating the katabolic activity of work; and that when the two balance one another a level of productive activity is maintained. Practice may increase productivity still further, but practice only consists in using energy economically, so that more things are made with the same exertion previously required for making fewer. Interest also centres on the fact that quicker work during shorter hours is associated with less lost time (represented by sickness), from which health appears to be a function of activity; and, from the viewpoint of health, there appears to be an optimum rate of activity for the human organism which seems to coincide with the optimum rate of production. We have here direct evidence of the way in which the work of the Industrial Fatigue Board bears upon two most important national needs—industrial productivity and health. The Board will indeed justify its existence if it is able to convince those who control the destinies of the industrial world that material wealth and individual health depend, so far as labour is concerned, on the same factors.

[1] The Speed of Adaptation of Output to Altered Hours of Work. By Dr. H. M. Vernon. Report No. 6. Industrial Fatigue Research Board. 1920. Pp. 33. 1s.

HERPES ZOSTER AND CHICKEN-POX.

CONSIDERABLE interest has always attached to the comparatively trivial ailment, herpes zoster or shingles, owing to the apparent connexion between its points of outbreak and the distribution of nerve branches, making it an obvious example of so-called trophic influence—the direct influence of nervous stimuli on cell nutrition. How this stimulus is brought into play in the case of herpes has remained obscure. It has been suggested that it represents a condition of the sensory side of the central nervous system closely resembling or identical with that which on the motor side constitutes acute anterior poliomyelitis, while the frequency of the outbreak of labial herpes as a concomitant of several different infective fevers—pneumonia, cerebro-spinal fever, coryza, and so forth—would tend to indicate that a variety of different poisons are equally capable of exciting the underlying nervous disturbance. Apart from the fact that the essential lesion of herpes is a simple vesicle, and so resembles the exanthem of chicken-pox, there is nothing at first sight to suggest any further connexion between the two conditions. Some curious instances have, however, been recorded in which infection with varicella has followed contact with a sufferer from herpes zoster, and the suggestion has seriously been made that the latter is in reality a localised varicellar eruption. The question is discussed in an interesting paper by Dr. Claude B. Ker, which appears in our present issue, with the practical conclusion that much stronger evidence than any at present brought forward will be needed to establish so novel an identification. With two such relatively common diseases coincidence is hard to eliminate. The cutaneous manifestation of chicken-pox may be reduced to a very few spots, even to one single vesicle, while the clinical phenomena are so slight as easily to escape notice—facts which render it difficult in any case to eliminate the possibility of some overlooked source of infection. Indeed, if the rash may be reduced to one

vesicle, it seems probable that cases exhibiting no eruption at all may from time to time occur, and without the typical rash they would be quite impossible to identify. On the other hand, it has been stated that there may exist a generalised form of herpes with scattered lesions closely resembling varicella. The distribution of the vesicles is typically along a particular nerve; but it is not unlikely that more than one nerve may be affected at the same time, giving rise to the simultaneous appearance of characteristic groups of vesicles in different parts of the body. Seeing that the eruption of chicken-pox may in some instances be localised in areas of special irritation, such cases might give rise to difficulties in diagnosis. Dr. Ker suggests that the question of the relationship between herpes and varicella is one in which the general practitioner is in the most favourable position for making observations, and hopes that some among our readers may contribute data towards a solution of the problem.

SECRET REMEDIES IN AMERICA.

THE Proprietary Medicines Bill has passed the Committee stage in the House of Lords, and this should turn English legislators to examine the success which has crowned the efforts of American reformers in a similar direction during the last 15 years. By the Federal Food and Drugs Act the sale of "misbranded" drugs became illegal. For five years it was held that a drug was misbranded if the description published on the package or label claimed a cure for diseases which in effect the drug did not cure. Later a decision of the Supreme Court confined this term to descriptions of composition and sources of origin. But during those five years many significant changes appeared on the labels of proprietary medicines. California syrup of figs, which has preserved its old description in Great Britain even to the present day, was known in America, from the passing of the Federal Act, as syrup of figs and elixir of senna. The American also is told that the mixture contains 6 per cent. of alcohol—a fact of which many Englishmen are doubtless in ignorance. In other cases the change was more radical. The labels on Dr. Kilmer's swamp root as sold in England continued to assert—

"It cures enlargement of prostate gland, seminal weakness, spermatorrhœa, generative debility, and general languor. Drives malarial poison out of the system ..... purifies the blood."

In America the following modest claim had to be substituted:—

"It will be found very beneficial in cases of debility."

Such illustrations are instructive as evidence of the possibilities of legislation in combating this dangerous trade. The Food and Drugs Act has been in force for nearly 15 years and there are still many fraudulent and thriving concerns in America, but with English coöperation their days are now numbered. The American federal authorities are also able to prosecute any firm which can be shown to be "conducting a scheme for obtaining money through the mails by means of false and fraudulent pretences, representations, and promises." Against such firms a fraud order is issued and the business is closed down. In a leading article which appeared in THE LANCET of June 12th (p. 1274), before the present Bill was introduced, we set out the amazing story of the "Medical Mail Order Frauds" in America, coupling the toast with the name of sargol.

More than any other single organisation the American Medical Association have been responsible for the advances which have been made. Their propaganda began when in the year 1905 they reprinted in booklet form a series of articles which had been appearing in *Collier's*. That was the beginning of their public campaign, although for some years previously they had directed their efforts to eliminating certain proprietary articles from the armamentarium of American practitioners. Since 1905 the journal of the Association has published many articles exposing various nostrums and many of these articles have been reprinted. The earlier ones have also been collected into book form.[1] The Association maintains a Council of Pharmacy and Chemistry, which decides not only the therapeutic merits of the advertised prescriptions, but even the more delicate question of whether a harmless concoction is being sold at too high a price. Naturally, a chemical laboratory is kept busy analysing and researching into the value of various orthodox and unorthodox remedies. In the matter of propaganda—for which a special department has been created—they are careful to insist that their work is educational and not punitive. Their office is richly furnished with references and cross references, stored by the card-index system, and has become a clearing house of information on medical frauds of all kinds. The poster has of late been used with success for popular education. A catalogue of these posters is sent gratis on application, as well as a list of the publications of the department.

A GREAT GIFT.

THE example set some time ago by the Shell Company, which gave £250,000 to Cambridge University for the general improvement of scientific teaching and training, with no conditions attached to the gift, has been followed by the British Dyestuff Corporation, which has given a large sum to the Universities of Manchester and Oxford for chemical research. At an extraordinary meeting of the shareholders of Messrs. Brunner, Mond, and Co. on August 4th the following resolution was carried in the face of a small but energetic number of shareholders:—

"That the directors be and they are hereby authorised to distribute to such universities or other scientific institutions in the United Kingdom as they may select, for the furtherance of scientific education and research, the sum of £100,000 out of investment surplus reserve account."

This was the second attempt to persuade the shareholders to accede to the unanimous recommendation of the directors. The chairman gave an interesting analysis of what such an apparently—and actually—large gift for the promotion of scientific education, training, and research really meant when set forth in cold economic business monetary calculation. "This is how it works out," said the persuasive chairman, "on such a huge capital as that of Brunner, Mond, and Co. If the £100,000 was divided in cash it would amount to 2½*d.* a share gross, subject to income-tax. If it were left in the business and earned 10 per cent. it would earn ¼*d.* a share in interest, less tax." The example of these great business firms ought to be taken to heart by others who have lost nothing through the war. In 1911–12 the State aid received by the German universities was £1,220,000. All British universities are suffering from want of funds, and donations to them evoke a feeling of gratitude to the donors. Further, these gifts are national investments. But they should not relieve Government of its duty towards the maintenance and advancement of scientific education in this country, which ought not to be left to haphazard windfalls, subject to the vicissitudes of trade and the goodwill of shareholders in successful chemical and engineering combines. Even now, with all the trumpeting, advertising, and propaganda work, wealthy Lancashire has only subscribed £212,000 out of the total of £500,000 asked for to enable the University of Manchester to keep financially abreast of the times.

THE FUTURE OF METROPOLITAN WATER-SUPPLY.

THE report recently issued of the Departmental Committee appointed to inquire into the provisions and effect of the Metropolis Water Act, 1902, should the recommendations be adopted, affects the consumer's interests in many ways. Apart from his pocket, questions of health may arise with the suggestion of a limited supply. Briefly, the Committee considers in regard to administrative personnel that a reduction in the number of members of the Water Board

[1] Nostrums and Quackery. Chicago: American Medical Association Press. Second edition. 1912. $1.

would add to its efficiency, and further recommends that the Board should appoint a general manager, so as to secure a coördination of general policy. Amongst other things, it concludes that the charges fixed under the Act of 1907 should be increased. It is suggested that the maximum rate for domestic supplies should be raised from 5 to 10 per cent., but no higher rate than 7½ per cent. is to be imposed without the authority of the Ministry of Health. The Committee, further, does not consider that there should be a public water rate as such; but though a deficiency rate should not normally be necessary, the power to levy such a rate should be retained. It is considered that the provision for the storage of water which the Water Board is making is, in present circumstances, not extravagant, while at the same time the Committee is impressed with the large amount of the demand, and expresses the hope that the need for economy in consumption will receive public attention. Incidentally a well-deserved tribute is paid to the services of the Water Examination Department of the Board, under the guidance of Sir Alexander Houston, whose work in keeping a close watch on the quality of the supply and its maintenance and economic working is well recognised. Finally, the Committee does not think that it is necessary to continue, when the office becomes vacant, the appointment of a water examiner by the Ministry of Health. This appointment was subject to the authority of the Board of Trade, and afterwards the Local Government Board, and the stipend was paid by the various companies concerned before an amalgamation was effected. It is debatable whether the policy of charging for water service on rateable value is sound, but, of course, it is based on a pre-charge, which is not the case with gas or electricity. The meter, after all, is a measure of the consumer's usage.

ANTITUBERCULOUS VACCINATION.

AN interesting communication[1] was made to the Royal Academy of Science at Bologna by Professor G. Martinotti last May, in which he described the beneficial effects obtained by a vaccine prepared by him on somewhat new lines. This vaccine is neither a tuberculin nor a serum, but contains, among other substances, a protein derived from cultures of tubercle bacilli, which acts as an antigen and is capable of producing under favourable conditions an active immunisation with respect to tuberculosis. Ordinary tuberculin is a substance eminently toxic; in fact, it contains the toxins elaborated by the tubercle bacillus on an artificial substratum totally different from that in which the bacillus develops in the animal organism. Moreover, the chemical processes by which it is prepared are sufficiently powerful to change in a marked degree organic compounds, even if as resistant as the toxins of tuberculin seem to be. According to Professor Martinotti, the scope of immuno-therapy should not be to kill the tubercle bacilli or to neutralise their toxins, but to render the body elements resistant to their attacks and frustrate their action. It is known that the tubercle bacilli act by stimulating the body cells to proliferate. This proliferation, caused by an abnormal stimulus, does not, however, lead to the formation of other normal cells as under ordinary conditions, but of special elements, the epithelioid cells, fatally destined to perish. Once the cell has come under the influence of this special stimulus it is lost; the epithelioid cells born from it will fall into necrosis either by the action of the tuberculous toxins accumulated by bacilli which have multiplied in situ, or from insufficient nutrition due to the fact that the tuberculous process involves the blood-vessels and renders them impervious. In this necrotic detritus the tubercle bacilli will multiply, act on the contiguous cells, and form a tuberculous focus capable, by a repetition of the process, of extending throughout an entire organ, ultimately spreading throughout the whole body, if it be not in a state to oppose the necessary defences. If, on the other hand, the normal cells do not respond to this abnormal stimulus and do not proliferate, the tubercle bacilli can remain in the body, live in the organic juices, multiply and pour into the organism the products of their limited vital activity, and hence do some harm to the organism which harbours them; but they will not be able to exert their special pathogenic activity and will not lead to the development of a true tuberculous process with all its consequences and complications. In other words, they will no longer be parasites, but will become saprophytes. This is what happens in latent tuberculous infection; many individuals, especially in populous centres, carry in their organs living and virulent tubercle bacilli which remain for a long time inactive up to a certain point. But they exert a sinister influence on organic evolution by preparing that "hypoplastic constitution" which forms the soil propitious to the development of the tuberculous process. In immunising against tuberculosis it is sought not to kill the bacilli but to render them inoffensive and saprophytic by reinforcing the resistance of the body elements, so transforming an active tuberculosis into a latent. But it must be remembered that the bacilli remain alive and virulent for a long period, and it is only after years under the most favourable conditions that a complete cure can be spoken of. In fact, in the generality of cases, the cure may be said to be provisional, and the immunising vaccination must be repeated from time to time. Over a hundred surgical cases treated by this method have been published by Professor Remedi, director of the Surgical Clinic at Siena, and a similar publication from the Medical Clinic at Modena is stated by Professor Martinotti to be already in the press. We look forward with interest to further information.

[1] La Riforma Medica, July 3rd, 1920.

"WHAT EVERY MAN SHOULD KNOW."

WE have already noted on several occasions the decision of the Portsmouth Council to popularise by official action the methods of venereal prevention among the male population of the borough. The following is the text of the notice now issued widely by order of the Portsmouth Health Committee, and signed by Dr. A. Mearns Fraser as medical officer of health:—

1. Venereal Diseases (i.e., Syphilis or "Pox," and Gonorrhœa or "Clap") are the common result of promiscuous sexual intercourse.

2. Venereal diseases not only result in immediate suffering but are often the cause of early death. Worst of all they are the cause of blind, diseased and deformed children being born into the world, and of life-long suffering to innocent wives.

3. To avoid venereal disease the only ABSOLUTELY safe course, the right and manly course, is to avoid fornication. Male chastity, although it demands the exercise of self-discipline, is quite consistent with perfect health.

4. If any man indulges in promiscuous sexual intercourse it is his bounden duty, in order to avoid disease which he may pass on to innocent people, to adopt the following simple measures, which are the best known to medical science for preventing disease after exposure to infection.

5. After exposure to infection he should at once retire to some convenient place, wet a piece of cotton-wool with a SOLUTION OF PERMANGANATE OF POTASH OR CONDY'S FLUID and thoroughly swab the male organ—see that every part is wetted with the solution. It is of the utmost importance that this should be done *as soon as possible* after exposure to infection. (The strength of the solution of permanganate of potash is 1-1000; it can be made by dissolving in a glass of water as much of permanganate of potash crystals as will cover a sixpence.)

6. The above method of prevention of disease is based upon the fact that venereal diseases are caused by living germs which after exposure to infection lie on the surface of the skin, and the *prompt* application of the above solution (or, indeed, of any other effective disinfectant) destroys them before they can gain access to the system and set up disease.

7. All men are earnestly advised to abstain from the sin of promiscuous sexual intercourse. If they neglect this advice they are besought carefully to observe the above instructions. To fail in this will involve suffering in the future upon innocent women and children.

[Sentences numbered 2, 3, and 7 are printed in red ink, so that they attract the eye at the first glance; 2 and 7 are, in addition, printed in bolder type.]

Men are advised on the notice to read a leaflet, extending the teaching contained in the notice, and obtainable on application to the Health Department at the Town Hall.

THE CARRIER IN FOOD POISONING.

THE possibility of food infection by contact with a carrier seems to have been well established in a remarkable case of food poisoning reported from Lambeth last week. So far it has been assumed without rigid proof that the Gaertner group infections, the cause of food-poisoning outbreaks, are of human origin, the food being infected with pathogenic Gaertner bacilli from a human source, either an actual case of paratyphoid fever or a carrier case. The subject is ably summarised by Dr. William G. Savage in his recently published book on "Food Poisoning and Food Infections," reviewed in our issue of July 10th last. The circumstances in this case at Lambeth, according to the evidence of Dr. Joseph Priestley, the medical officer of health, are as follows. The outbreak was confined to one house in which ten persons were living, all of whom were affected. One (Mr. K——e) died, and Dr. B. H. Spilsbury said at the inquest that death was due to syncope from acute enteritis. We understand that the other sufferers are now convalescent. Dr. Priestley ascertained that on Saturday a stew of steak and liver had been prepared and consumed, the gravy being saved until the following day and warmed up with a Yorkshire pudding. On the previous Thursday the wife of the landlord (Mrs. H——y) who undertook the preparation of the food, was taken ill, and the climax of her illness was reached on Saturday night, although she continued to attend to her household duties. Dr. Priestley expressed no doubt that the source of infection of all persons was the gravy from the liver, which was itself sound. The outstanding feature of the case, in fact, is that the person who prepared the food suffered from the same disease as the others two days before they were taken ill, and instead of going to bed she did the cooking for the whole of the household for two days, the result being that the liver gravy was infected. Dr. Priestley was inclined strongly to the conclusion that this person was a carrier of the bacillus, who having previously suffered from food poisoning had during culinary operations sown that bacillus in the gravy of the repast. This evidence, we learn, is amply supported by subsequent bacteriological investigation, the causative bacillus having been found present in the organs of the deceased and in the blood of those who have survived.

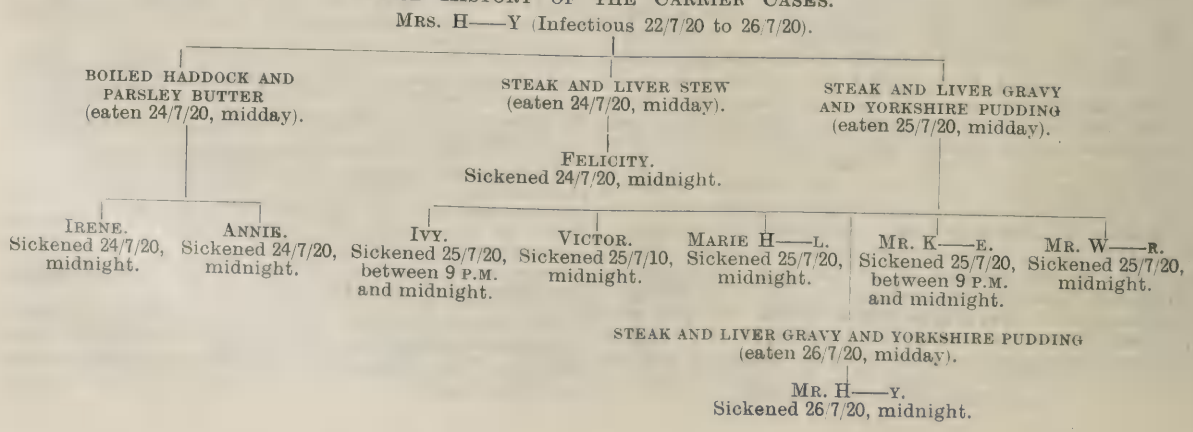
According to the results obtained at the Lister Institute the bacillus proved to be the "mutton" type of the large paratyphoid B group which has been comparatively recently described and named, including a large number of the strains formerly referred to as the *Bacillus aertrycke* or *suipestifer*. The coroner, Mr. S. Ingleby Oddie, brought in a verdict of "Death from gastro-enteritis by food-poisoning misadventure" in accordance with the evidence given by Dr. Priestley. The accompanying diagram furnished by him gives graphically the particulars of the outbreak. The case is a remarkable one, and, if rare, somewhat disturbing in regard to the risks involved in kitchen régime.

SIMPLE ULCERATION OF THE GENITALIA.

Dr. Noah E. Aronstam,[1] of Detroit, classifies the varieties of simple or non-specific ulcers of the genitals as follows: (1) The herpetic ulcer; (2) the gonococcic erosion; (3) erosion of the sebaceous follicles; (4) the traumatic abrasion or erosion; (5) the diabetic ulcer; (6) the tuberculous ulcer. Herpetic vesicles, either spontaneously or as the result of irritating applications, may become abraded, and the coalescence of individual erosions may give rise to a large and extensive ulcer. The diagnosis is established by the co-existence of unruptured vesicles side by side with the ulcers. Treatment consists in the application of dry dressings or the use of simple dusting powders. Gonococcic erosions of the glans and prepuce are apt to arise in the course of gonorrhœa with an elongated and narrow prepuce and may form the starting point of venereal warts. Gonococci are usually demonstrable on microscopic examination. Treatment consists in the use of mild antiseptic solutions, but occasionally circumcision is necessary. Erosion of the sebaceous follicles with which the skin of the genitals is profusely supplied is mainly due to staphylococci and is frequently met with in those who work in oil or paraffin. Small local abscesses occur within the sebaceous follicles and rupture spontaneously, leaving a crateriform opening. Caustic applications will produce a marginal or peripheral induration which may be mistaken for that accompanying a primary syphilitic lesion. Treatment consists in the application of moist dressings or solutions of lysol or bichloride. Traumatic abrasions or erosions may sometimes arise from the use of rough underwear or from excessive moisture of the parts caused by perspiration in hot weather. The lesions are very superficial, and rapidly heal up on the application of ordinary dusting powder. The diabetic ulcer is usually very extensive and may assume a serpiginous and phagedænic appearance. It differs from chancroid by never presenting a worm-eaten, undermined character and being as a rule unilocular, but resembles it in healing with great difficulty. As in all doubtful ulcers of the genitals, a urinary examination and a serological test should be performed. As a rule, in such extensive lesions sugar will be found in varying proportions. Local treatment seems to be of little avail, so that an attempt should be made to improve the general condition by a strict regimen. Tuberculous ulceration of the genitals is very rare and is usually met with in early youth. Its usual sites are the glans and dorsal surface of the penis. Phagedæna is characteristic: the ulceration is deep and the margins are indurated. In spite of repeated examination the pus may appear sterile until suddenly tubercle bacilli are discovered. Treatment in such cases is not promising, radiotherapy and hypodermic injections of tuberculin having been used with indifferent results. Dr. Aronstam concludes by drawing attention to the possibility of malignant changes supervening in these chronic ulcers, especially in advanced middle age.

[1] The Urologic and Cutaneous Review, July, 1920.

THE HISTORY OF THE CARRIER CASES.



THE THERAPEUTIC USE OF OXYGEN.

Dr. R. D. Rudolf, of Toronto, has published a useful paper[1] expounding the present position of oxygen therapy. For a healthy person the 20 per cent. of oxygen in ordinary air is more than sufficient to saturate the hæmoglobin and supply the necessary partial pressure in the plasma (about one-fortieth of that in the hæmoglobin), while the percentage of oxygen in the air may be reduced to 14 per cent. without causing any distress. Thus the air contains a higher percentage than is needed by a healthy person when resting. But on exertion he will soon become breathless and then, as shown by Dr. Leonard Hill, he can do more work without distress when breathing an atmospere artificially enriched with oxygen. As Meltzer puts it, the difference between the 14 per cent. which is all the oxygen required when at rest and the 20 per cent. is a "factor of safety." While this is sufficient for the demands of ordinary exertion, it is not for emergencies. A man suffering from disease interfering with respiration may be likened to a healthy one undergoing severe exertion. Moreover, at high altitudes the partial pressure of oxygen may be less than that of an atmosphere containing 14 per cent. of oxygen, and there is no margin of safety. The least exertion may bring on dyspnœa. At a still higher altitude, as in the case of airmen, dyspnœa may come on without exertion. Again, it has been found that at altitudes of 6000 feet and over cases of pneumonia do badly, the factor of safety being now absent. Hence, at Cripple Creek (altitude 10,000 feet) in the Rocky Mountains cases of pneumonia are put on the train and sent down to the prairie level. Dr. J. S. Haldane has applied the term anoxæmia to "the condition when the rate of supply of oxygen is insufficient for the normal carrying on of life." Its causes are four: (1) defective saturation of the arterial blood with oxygen; (2) slowing of the circulation; (3) defective proportion of available hæmoglobin in the blood; (4) alteration of the dissociation curve of the oxyhæmoglobin, so that this gives off its oxygen less easily than usual. Examples of the first cause are decrease of oxygen pressure in the inspired air or interference with the passage of air to the blood. Slowing of the circulation will tend to anoxæmia by allowing the blood to dwell too long in contact with the tissues. Anæmia means want of hæmoglobin in the blood, and poisoning with carbon monoxide, nitrites, or arseniuretted hydrogen will prevent the hæmoglobin from carrying oxygen. Bohr, of Copenhagen, has shown that, if the carbonic acid in the blood be lowered, the hæmoglobin will not part with its oxygen. As to the relation of anoxæmia to cyanosis, it may be said that cyanosis always means anoxæmia, but there may be anoxæmia without cyanosis, as in carbon-monoxide poisoning when the blood is cherry red, and yet the patient may die from anoxæmia. Again, when carbonic acid is deficient, the tissues may suffer from anoxæmia, and yet the blood be red with oxyhæmoglobin, with which it will not part with its oxygen (according to Bohr's law). It should be remembered that it is the amount of oxygen in the blood plasma which counts. Normally it is about 0·35 c.cm. in 100 c.cm. It is used up by the tissues and replenished from the hæmoglobin. But by increasing the oxygen in the inspired air the amount in the plasma may be raised to 3 c.cm. in 100 c.cm. Anoxæmia, which is shown clinically by cyanosis, is damaging to the tissues, and therefore should be relieved if possible. As Dr. Haldane says, "Cyanosis may always be taken as an indication that oxygen inhalation should be considered." There are two kinds of cyanosis: (1) the leaden colour of the skin, often seen in acute respiratory conditions, when the hæmoglobin is reduced and yet the veins are not over full, and (2) the blue colour of the mucous membranes when the veins are distended. In the latter venesection, followed, if necessary, by oxygen inhalation, may be called for. The common way of administering oxygen with a funnel held near the face connected with the cylinder Dr. Rudolf considers useless. Meltzer has shown that it is not possible thus to raise the percentage of oxygen in the inspired air by more than 2 per cent. Moreover, the funnel gives the dyspnœic patient a sense of suffocation. Dr. Rudolf makes the same objection to Haldane's apparatus, which involves placing a mask over the patient's face, and also to Leonard Hill's. He recommends as a much better method, one which has been used extensively in the war—administering the oxygen through a soft rubber tube inserted into one nostril and held in position by a strip of strapping. It is a wasteful method, but very efficient. Its efficacy can be increased if an attendant closes the opposite nostril during each inspiration. Under this treatment patients cyanosed from influenzal pneumonia, though treated in the open air, improved visibly in a few minutes. Not only did the cyanosis lessen or disappear, but the breathing became slower and deeper.

[1] American Journal of the Medical Sciences, July 1920.

THE UNIVERSITY CHAIR OF RADIOLOGY.

THE Senate of London University invites applications before Sept. 23rd for the post of Professor of Radiology, tenable at the Middlesex Hospital Medical School, with a salary of £1000 a year. London schools have been honourably associated with pioneer work in the application of electric waves to the needs of suffering humanity. It was John Birch, surgeon to St. Thomas's Hospital, who founded an electrical department there towards the end of the eighteenth century and carried it on nearly single-handed for a period of 21 years. His essay on the Medical Applications of Electricity, published in 1802, had a wide circulation in this and other countries, being translated into Italian and Russian. A century later the realisation by Wilhelm Conrad Röntgen of Hamlet's promise to his mother—

> You go not, till I set you up a glass
> Where you may see the inmost part of you—

was taken up with alacrity by the authorities of the Middlesex Hospital, who appointed a physicist on their staff, and coördinated his work with that of the Cancer Research Laboratories, and later with the Bland-Sutton Institute of Pathology. Hence the names of Sidney Russ, W. S. Lazarus-Barlow, the late C. R. C. Lyster, H. A. Colwell, and others stand for an application of electrical method to medicine which cannot fail of its fruit in due time. The effect in animals of X ray irradiation of the thymus, which becomes thereby reduced to a mere fibro-adipose residuum; the selective destruction by the rays of spermatocytes and spermatogonia; the action of radium in diminishing the power of transmission in cancer cells: these have been among the objects of investigation at the Middlesex Hospital. With this tradition we may feel assured that the University Professorship, the first of its kind, will attract some highly capable expert whose inclinations tend towards research rather than to private practice. Provided adequate assistance is afforded to help in the routine X ray work, the opportunities offered for research at this hospital should prove more than adequate. The holder of such a post might well achieve work of great practical value, not only to the science of radiology, but also to various departments of medicine and surgery. It is not too much perhaps to hope that a specialist with original ideas might stimulate useful team-work in conjunction with the clinical staff on one side and with the chair of physics on the other.

UNIVERSITY OF PARIS: FACULTY OF MEDICINE.—A revision course on the Application of Laboratory Methods to Diagnosis is to be held from Sept. 24th to Oct. 12th in the medical clinic of the Hôtel-Dieu (Professor A. Gilbert and Professor Maurice Villaret). The instruction will include 31 lessons of an essentially practical nature, time being left free each day for visits to hospital practice. The course includes a study-journey from Sept. 25th–29th to Evian and the principal watering places of Savoy—St. Gervais, Aix-les-Bains, &c.; it is open to French and English qualified men, as well as to matriculated students, and a certificate will be issued to each of those who take part in it. The laboratory fee is 150 francs. Details of the journey may be obtained from Dr. Paul Descomps, Clinique médicale, Hôtel-Dieu, Paris.

PROVISION OF EXPERT MEDICAL AND SURGICAL TREATMENT.[1]

BY A. H. BYGOTT, M.D. LOND., D.P.H.,
BARRISTER-AT-LAW; COUNTY MEDICAL OFFICER OF HEALTH FOR WEST SUFFOLK.

THERE is no line of demarcation between preventive and curative medicine. There is one science of medicine whose duty is to attack disease whenever it appears, and although the medical officer of health pays special attention to the environment of the individual, yet the large amount of treatment provided by health authorities during the last few years gives most medical officers of health a title to speak on this subject from personal experience. Moreover, because he is not engaged in a competitive monetary struggle, an M.O.H. may possess a clearer vision of what the public needs than does the practising physician. It is of vital necessity for this country that we should reconsider many phases of our social machinery, as the health and working capacity of its citizens are its greatest assets. Unfortunately, whilst realising that housing, industrial, and economic conditions of the workpeople may fairly claim our first attention, with a view to preventing the necessity for treatment at all, in the present economic condition of the country large reforms in these matters must take a considerable amount of time to evolve. Twelve years' medical inspection of school children, the attention that has been paid within the last few years to maternal and infant welfare, and especially the results of the examination of most of the adult manhood during the war, show that there are in this country a large number of people needing adequate medical treatment who are not getting it. This leads to the loss of a considerable amount of working capacity which the State badly needs, and tends to dwarf the minds of thousands of people, rendering them discontented and dangerous to the State; a C 3 body is often associated with a C 3 mind. Many keen young men returning from the different theatres of war are profoundly dissatisfied with the present state of things, and wish that medical service shall be placed on a dignified and business-like basis. This volume of young vigorous thought, added to the considered opinions of many of the older members of the medical profession who have fought unsuccessfully against these adverse conditions for many years, needs to be organised and directed so as to secure the attention it deserves.

It is now acknowledged that the primary necessity for getting effective improvement is a greater enlightenment of public opinion. It must be remembered that we have only had a national system of elementary education for about 50 years; that knowledge of anæsthetics is only some 70 years old, that of antiseptics 50, and that of the bacterial causes of disease only some 35 years old; we have not really had much time to build the solid edifice of first-rate medical service that we need. We have left behind us the day when Dr. Abernethy made that scathing indictment of his professional colleagues, that they put drugs of which they knew nothing into bodies of which they knew less. The chief work of the practitioner of to-day is to recognise any failure from health as soon as possible, and to place the patient under proper conditions for recovery, with the assistance of skilled technique, and special surroundings such as country environment where these are indicated. The day of the apothecary who seizes upon some prominent symptom of disease, often a valuable danger signal, and covers it up and masks it as quickly as possible with some soothing drug, is drawing to a close. Doctors were never able to do so much for their patients as they can now, but the work must be done in an entirely different way to that adopted 30 years ago. The first need for expert medical and surgical services is that they shall be up to date, capable of progressing, and that all the lessons learnt in the war as to handling and treating the sick shall be utilised to their fullest extent.

The Need for Help from the Public.

When these questions are brought forward for discussion there is often a tendency on the part of the public to regard them as too difficult and technical to be understood, suggesting that they should be left to the medical profession, and there seems to be a widespread view that there is some medical authority behind the scenes, which is responsible for improvement in medical matters. This vague authority does not exist and any improvements in organisation must come from the public themselves. It is not possible for the man in the street to decide whether ipecacuanha or squills is the better drug to use in some particular case of pulmonary disease, but he may be able to express a better opinion than some medical men, who do not take a broad view of such questions, as to whether hospitals should be situated in densely populated areas in large towns as at present; or whether most of the work there should, with our better means of transport, be done under rural surroundings, the present hospital becoming a casualty station. He should consider such questions as to whether it is sound economics for probably nine-tenths of the surgical work in this country to be done in hospitals without payment to the medical staff, so that the burden of the other tenth is laid upon one section of the community only; this procedure presses very hardly upon those persons just outside the hospital class if an important operation is required for the bread-winner, who may be leaving his dependents to the mercy of the world. These are problems capable of being solved by ordinary intelligent people, and the knowledge that the engineer has of the specialisation of function by craftsmen in the engineering trade, or that of the schoolmaster, working in a school where different subjects are taught by different people having special knowledge of them beyond that of a good general education, may well be applied to such questions as this.

Considering that specialised treatment as we know it has been built up within the last 70 years, and a great deal of the technique comparatively recently, we have first of all to consider what responsibility the patient has in the matter. He would be much more likely to seek assistance early if he were better educated in the knowledge of the incidence of disease so that he might consult a doctor when certain signs, which may lead to serious consequences, first appear. At the same time, he must be taught that no treatment can hope to be successful unless the patient coöperates in his own cure. The practitioner and district nurse form the first line of medical defence and no provision of expert services can be successful unless it gives the fullest scope to the activities of these persons. The practitioner must be provided with proper working conditions, so that he shall see his patient in good surroundings, well lighted with a good light, supplied with proper instruments for necessary examinations, and more especially with attendants who will be able to keep his equipment in order, and assist him where possible in the responsible work which he has to do. Especially in rural districts, the combination of the practitioner and district nurse should be much more intimate than it is now. The present system, by which a practitioner at the end of an exhausting day's work usually sees most of the patients in his surgery, without any regard to his own excessive industrial fatigue, needs modification at once.

Improvement of Hospital Services and Statistics.

As the bulk of expert medical treatment is provided in hospitals, the consideration of the present condition of these institutions and suggestions as to how the hospital services in the country may be improved must form the most important part of this paper. Hospitals were primarily intended for the sick poor, and a perusal of the records of the Hotel Dieu in Paris, where many people were crowded together in very large beds, shows that at one period of our history very little care was given to really efficient treatment. A very interesting life history of Lord Lister by Dr. Wrench,

[1] A paper read before the Society of Medical Officers of Health in London on May 28th, 1920.

showing the fight against enormous odds which he waged 50 years ago to introduce antiseptic surgery in England, shows that the state of the London and provincial hospital then left much to be desired.

Unfortunately, we have not improved as much as we ought. The hospital of to-day is still regarded too much as a charitable institution, and too little as the centre of medical life in the area, in which the largest amount of expert medical work in this country is done. For instance, the ordinary hospital report published to the subscribers each year contains much information as to the financial condition of the institution, and records the generosity of the donors, but the statistics given as to the nature of the work done is very unsatisfactory to the medical officer of health who wishes for exact and reliable information as to the incidence and methods of dealing with disease in his area. This has been specially commented upon by the Royal Commission on Venereal Disease, who suggested that hospitals maintained by voluntary subscriptions should supply more information on these subjects than they do at the present. In the county of West Suffolk, with a population of 116,000, 150 to 200 deaths from cancer occur each year; no details are given in the report of the County Hospital as to the number of such cases dealt with. A house surgeon kindly informed me two years ago that, including the removal of small growths of a suspicious nature, about 30 operations for cancer were performed there every year. As most of the more populous areas are on the edges of this county, and these inhabitants obtain help from general hospitals in other counties, it is quite impossible to ascertain from these sources how many of the cancer cases in the county are dealt with by operation. The house surgeon also stated that about 30 cases were operated on for diseased tonsils and adenoids, and about 80 patients per annum suffered from appendicitis; the population served is probably about 50,000, and the number of beds is nominally 100, of which from 60 to 70 are usually occupied.

Such is the responsible position of the local hospital that it would be reasonable for the Government to require that each hospital should publish a few statistics showing the nature of the work done there, so that the public may know how it fulfils its function as the main sources of supply of the highest forms of medical service in that locality. Some hospitals do not seem to realise this responsibility, and fail to appreciate what may be the plight of the patients whose admission they may be compelled to defer or refuse. In London some acute cases are referred from hospital to hospital in a manner likely to prejudice their recovery and cause them unnecessary suffering, and no responsible person ever knows or seems to concern themselves as to what eventually becomes of them. A practitioner recently told me that two shop-girls in the county for whose admission to a London hospital he had arranged some months ago were still at work and waiting for a bed, one with severe metrorrhagia and uterine fibroids and the other with ovarian disease. We ought to visualise the position of these girls, two only out of an army of sufferers, going to their work day by day, dreading these operations, sometimes hardly able to carry on. It is our duty to improve this system at the earliest possible moment.

General and Special Hospitals.—The Letter System.

The size of the hospitals varies considerably and their distribution in the country is very irregular; 15 counties have one or more with over 200 beds, 20 have some with 100 to 200, eight have hospitals with 50 to 100, seven with 25 to 50, and nine with a smaller number of beds. Specialisation and methods of staffing vary considerably. Considering the two kinds of institution, general and special, and having attended and seen the work done in both, I can affirm that the use of special hospitals shall be discouraged as much as possible, by arranging special departments in the general hospitals. Specialities tend to overlap very considerably, and it is a great advantage for the patient to be transferred to another department in the same institution rather than to be sent somewhere else.

The method of admission to these institutions may be either absolutely free, that is to say, that any person may claim their assistance, or that their services may be given in return for a recommendation from a subscriber known as the subscriber's letter. This usually means that in return for a subscription of £1 1*s*., a subscriber is entitled to send six persons for out-patient treatment, and for £2 2*s*., a month or six weeks' residence in the institution is allowed for an in-patient nominated by him. This system varies considerably in different places, and is gradually dying out in the larger London and provincial hospitals. These letters may be handed over to clergymen and other social workers, and they are a source through which patients are admitted to these hospitals, except in certain emergency cases, and even then letters are sometimes asked for whilst the emergency is being dealt with. The letter system is a very bad one; it deprives many people of adequate hospital service, and others who accept it feel there is a certain loss of dignity in doing so. Bishops once had the right to license women to practise midwifery; this function has now been placed in other hands, and it would be very much better for patients to seek the hospital service on their own initiative, or recommended by the doctor, rather than through a recommendation from the clergyman.

Deferred Admissions.

The number of beds in nearly all hospitals is very inadequate, and a selection of the patients has to be made. Most hospitals have a list of deferred admissions. This does not always secure that those cases most in need of treatment are the first to be selected; the protégés of the friends of the hospital may come first, and during the war, when the hospital beds at the disposal of the civil population were seriously cut down, it seemed very dreadful for the maidservant of some wealthy subscriber to be given precedence of admission for some trivial ailment over some unfortunate woman suffering from cancer whose life was at stake. When a serious operation is decided upon it is only humane to get it over as soon as possible, so that patients and their friends may be spared the anxiety of expectation. A long waiting list should be considered a disgrace to us. In some instances visiting medical officers admit patients to the beds, and as they are engaged in some form or other of medical practice their own patients may receive preference. In one case this system has been carried so far that an honorary surgeon in a large hospital has allotted to him about 40 beds, 20 of which are female. Where the patients are supposed to be admitted through a resident officer of the hospital, to be selected especially from the out-patients and other sources, the female beds at any rate are almost entirely filled by women recommended through the surgeon himself either as the result of a private consultation or at the request of some practitioner who has asked him to secure their admission. A country practitioner recently said, "I never send my patients to the local hospital; if they want admission to a hospital, I ask —— to deal with the case, and he always takes them into his hospital very soon."

The equipment of hospitals varies very considerably and in many institutions whose names are household words, owing to the lack of money there remains room for considerable improvement. In one important London hospital I recently found that one bathroom had to supply the needs of two large wards for male and female patients, so that it had to be used for each sex on alternative nights. Beds may be placed nearer to each other than is desirable, and there may be a lack of instruments and proper equipment. The staffing varies considerably. Specialisation, first attempted in London hospitals, was not originally carried to the point it is now, but in many large provincial hospitals it is still far from thorough.

The Junior Staff.

It is instructive at this point to note the way in which a man reaches the rank of a full surgeon in a London or provincial medical school hospital. After holding a post as house surgeon he becomes surgical registrar or its equivalent; he has access in this position to all the

records in the hospital, and assists in many of the operations, himself undertaking emergency cases. During this time he is probably fortunate enough to secure a post on the staff of a smaller hospital, where he has the opportunity of improving his surgical work. At the same time, he usually holds an appointment as a demonstrator of anatomy, and the teaching of this subject helps him very much with his other work. After some years of this experience—and usually by this time he is over 30 years of age—he becomes an assistant surgeon to his hospital, a post in which he may have to continue for 10 to 20 years. During this time not nearly enough opportunity is given to such a man to benefit the public by the excellent training which he has had. In some cases he is entirely dependent on his senior for beds, and if he is allotted a few he must consider himself very fortunate indeed. During all these years, before he comes a full surgeon of a hospital, his income is small and his professional expenses, including the heavy rent of consulting-rooms, are very considerable. This system tends to prevent brilliant men without any unearned income from undertaking such work, constituting a very serious loss to the State.

In any reform that takes place in the hospital service, it is absolutely necessary to see that the services of such men are utilised to a much fuller extent than they are now. When a man obtains the post of a full surgeon he is usually well advanced towards middle age, when he hopes to reap the financial reward of his success. And when this comes it limits the amount of time he is able to devote to the hospital, and results in irregular attendance, fixing operations at very inconvenient hours, visits paid late in the day or during meal-times. The other claims on a busy visiting doctor's time interfere with the comfort of patients and other residents in the hospital, and the irregularity is not conducive to first-class work. These disadvantages have been found to be so great that in the London Hospital an experiment is being made by which some of the major surgery is left in the hands of resident officers, who are paid a substantial salary for their work, and I am informed that similar conditions prevail in the hospitals in Paris. In county hospitals and in large towns there may be some attempt at specialisation, but it varies considerably; owing to the limited population and the almost exclusively industrial character of the area covered by these institutions it is often impossible for a man to make a livelihood by working in the neighbourhood as a pure specialist. The staff are thus nearly all more or less, and some entirely, engaged as general practitioners. As most of those engaged in general practice are chosen by seniority their practices are as a rule very large, and as they are accustomed in their ordinary work to see patients hurriedly, this overpressure, added to their want of leisure, prevents them from reading modern literature, or attending other institutions or meetings of learned societies where they may compare their work with that of others. A mental attitude is thus developed which is not conducive to the critical atmosphere necessary for careful diagnosis or the application of skilled technique, so that their work might with advantage be supplemented by help from the staff of a teaching hospital.

Major Surgery in the Cottage Hospital.

At the present moment a hospital is usually a water-tight compartment. As a rule, it must either take a case or leave it absolutely unprovided for; so that a surgeon with very limited experience in dealing with difficult cases may feel that it is his duty to perform some important major operation, or, on the other hand, to refrain from doing something which might be a material help to the patient, because he is unable to command better services. It has been suggested that each smaller hospital shall be related to a larger institution, to which it would be possible, automatically, to transfer cases requiring special skill, and the sooner this scheme is developed the better.

I recently had the opportunity of seeing a small cottage hospital in a small town, 10 miles from a large centre with a well-equipped hospital; it had four beds and faced a very narrow street, along which ran an open channel, into which, I am informed, household slops are sometimes emptied. The operating theatre consisted of a covered-in yard, and the house was supplied with a cesspool drainage. A local practitioner, who showed me round, informed me that such operations as prostatectomy were intended to be done there. At the present moment the only type of work done by medical men which is inspected is vaccination; and from the statements made by many public vaccinators it would appear that dissatisfaction is not infrequently expressed by the central authority at the way in which this simple operation is performed. It sometimes happens that in one of these cottage hospitals a practitioner with limited experience may perform a very serious operation which at present it is no one's duty to criticise.

I had the opportunity of seeing an elbow-joint which had been excised by a practitioner recently qualified, and which he had sent to an old teacher as a proof of his skill. This joint was apparently healthy, and ought not to have been removed. The patient probably had from 30 to 40 years' prospect of life, and to be compelled to spend this time with one arm like a flail must have interfered considerably with his working capacity. The only qualification this surgeon had for holding this hospital appointment was that he had recently purchased a practice or partnership in the neighbourhood. It seems reasonable that serious major operations, except in cases of extreme emergency, should not be done in a cottage hospital, and if it is considered desirable for major operations to be done there at all, the skilled and well-trained surgeons of this country should ask for, and cheerfully submit to a system of inspection which might do something to prevent operations under such conditions as those described above. As all our principal surgeons do most of their operations in public they are already exposed to a very thorough system of inspection, so that they need hardly be conscious that it was taking place.

There is increased and growing discontent on the part of the general practitioner, because he is unable to refer his cases to some practitioner engaged exclusively in consulting practice, as the only sources of consultation available to many of them are the services provided by local hospitals. Some time ago a practitioner complained that he had sent a patient with what he considered to be a cancer of the cervix to a local hospital for operation. The patient who was sent was discharged very soon, and was indignant with him for sending her there, because the hospital doctor had told her there was nothing the matter with her. Some months later she consulted her doctor again with an inoperable growth. He felt that both he and his patient were entitled to have had an opportunity of consulting a specialist, who should have decided the necessity for any operation that might have been necessary in such a case.

We may compare such procedure with that which takes place in enforcing the law, where a prisoner is only condemned to death after being dealt with by a judge who receives a salary of £5000 a year, is chosen as a master of his craft, and is provided with a considerable amount of assistance before arriving at his decision. And it has been suggested that if judges go on circuit to deal with such cases doctors should do the same.

An Interesting Experiment.

A very interesting experiment has recently been made in West Suffolk, due largely to the public spirit of the county director of the Red Cross. A distinguished consulting surgeon comes into the district at frequent intervals to operate on discharged and injured soldiers in the local hospital. This experiment appears to have been an unqualified success, and the medical officer of health suggested that a similar scheme might with advantage be adopted for other cases. During the war, when working on medical boards, I saw a number of disabled men who were brought in from the country for medical examination labelled as cripples, who, in some instances, possessed no working capacity whatever. A great deal might have been done for some of them by proper treatment, so I recently caused a census to be made with a view to ascertaining the

number of cripples in the county (population about 116,000), and these are some of the results. Of 127 cases reported on, 35 were said to have had some treatment at local hospitals, 22 at special hospitals in London. Many of them (70) had had no special treatment at all. Some cases unable to travel to London as often as necessary had to discontinue treatment so that any benefit received was entirely lost. In one case this happened after a mangle and wardrobe had been sold to defray the expenses.

This scheme was brought to the notice of the local branch of the British Medical Association, who expressed themselves enthusiastically in favour of it. At present some discussion arises as to what type of consultant shall be employed in working such a scheme. Members of the hospital staff suggest that he should be a senior consultant attached to a large London hospital. The situation would be met by employing an experienced member of the junior staff from a teaching school hospital, but in any case the principle is admitted that the services of the present staff do not entirely meet the needs of the district, and there is no provision for anything else. It is instructive to note that in one district in England where there is a fairly large local hospital three of the wives of members of the staff within recent years have required major operations, and although their husband's colleagues are expected to do such work in the local hospital, they were all operated upon by London surgeons. Without desiring to restrict the freedom of any patient to be operated upon by whosoever he wishes, provided the surgeon is a qualified practitioner, it cannot be too strongly urged that patients needing skilled examination or operation residing in any part of the country whatever should be given the opportunity of being examined and operated upon by a master of his craft. This can only be done by mobilising to the uttermost the services of the junior consultants, who would be able to render excellent services if they were only given the opportunity. We may again emphasise the point that such men are appointed by responsible hospital committees to give their services during the absence of their chiefs, and that any moment they may be called upon by death or accident to succeed the surgeon whom they are called upon to represent. A junior consultant to-day may literally become a senior to-morrow.

One of the causes of overcrowding in the large medical school hospitals is that many practitioners are recognising the disadvantages of local consultations, and are sending their patients to larger institutions rather than to the local hospital, causing a considerable amount of overcrowding. This could to some extent be avoided by sending well-trained consulting surgeons to consult and operate in the country.

A Survey of All the Hospitals.

It is therefore suggested that there should be a survey of all the hospitals in the country, that the smaller ones should become casualty stations, that some of those of a large size should have their staffs strengthened by a periodical visit from the consulting staff from a teaching school hospital, and that no attempt should be made for any supposed vested interests to exclude this valuable help. There are, especially in the North of England and in the other manufacturing centres, populous districts in which the inhabitants are chiefly working-class people, with a few well-to-do residents. The latter would probably avail themselves of the services of a consultant from London, or a neighbouring teaching school; most of the work-people receive specialised treatment at the hospital. Such a district is incapable of providing an income for a local specialist. Many of the hospitals in such areas are of appreciable size, and they ought without delay to reinforce their staffs from the nearest teaching school hospital, as specialist treatment is absolutely necessary to keep such an amount of working capacity at its maximum of efficiency. General practitioners are more and more anxious to avail themselves of really skilled help and are objecting to being provided with anything else, as they realise that the exacting life they lead and the hurried manner in which they have to deal with their patients does not afford them proper opportunities of doing this work themselves. It is specially desirable at this moment to emphasise this point, as the Ministry of Health are appointing a number of consultants to work the Insurance Act. These men, to be trusted as they should be, must be engaged in consulting practice, must be associated with the work of teaching school hospitals, and must be able to prove to those who employ them that they are keeping themselves up to date.

A Local Authority Hospital Service.

The outlook of medical service has been altered entirely by improving facilities for transport, and it is quite possible now to remove a patient 20 or 30 miles in a well-constructed ambulance without any inconvenience. In the came way, specialists are able to travel a very considerable distance to visit centres for the purpose of seeing patients, or performing operations in a way which was impossible when most of the hospitals were built. In addition to general hospital services, as supplied by local committees, there are Poor-law infirmaries, where the expert work is usually left to a medical superintendent, who has to administer a large institution and devote his energies to all types of cases. Although there are in this service a few men who do wonders in spite of these difficulties, this method of organisation is not capable of providing what is required. As some of the infirmaries in London south of the Thames have to serve the area largely as general hospitals, the question of re-staffing those institutions is a somewhat urgent one. They would form an excellent nucleus for a local authority hospital service. Local authorities have provided hospitals for infectious diseases. In the larger centres these are, as a rule, well administered, enjoy the confidence of the public, and afford an excellent reason for the hospital services of the State being undertaken by large local authorities; on the other hand, the administration in some of the smaller institutions leaves much to be desired. For instance, a county medical officer some time ago visited a small fever hospital where the nursing of the patients was left to the wife of an employee of the district council, who had to do such work as emptying the earth-closets. Although this woman had had some nursing experience, such a combination of persons and functions was not likely to attract the best type of officer. Some of the patients slept together in double beds, no easy chairs were provided, and patients convalescing from diphtheria were compelled to sit on benches without any backs. The food was stored in the bathroom and in the bath; the same tongue-depressor was used for examining a series of throats; no overalls were provided for the doctor or nurse; and there was no means of washing the visiting doctor's hands. This carries us back to the day when such institutions were regarded as a means of protecting the public, and the patient's recovery was quite a secondary matter. The remedy for such conditions would be a system of proper inspection of these institutions and the closing of many of them. This would be only fair, as it is not infrequent for patients to enter isolation hospitals under pressure, contrary to the wishes of their friends, and they ought to be provided with a proper service. This work could be carried on in central hospitals, the patients being moved there by motor ambulances. A larger institution is desirable for efficient and economical working, and provision should at the same time be made, where necessary, for the conveyance of the friends of those on the danger list, and sometimes for their accommodation in the institution.

In addition, health authorities to some extent fill in the wide gaps left in our hospital system by providing clinics and special treatment for diseases such as tuberculosis, venereal diseases, maternal and infantile disorders, diseased tonsils and adenoids, refraction work, and so forth. In many instances this help is provided through whole-time officers; it is, as a rule, very good, one advantage being that the medical officer of health is able to secure that the services provided are up to date. This limited ad hoc method of meeting the

situation is unsatisfactory. It would be much better to deal with the whole community through one large series of specialised institutions, the voluntary hospital maintaining its place in the system. It is absolutely unjustifiable, except on the grounds of pseudo economy, that women and children who constitute the largest number of patients of the ordinary doctor should be excluded from the benefits of the Insurance Acts. This, and the gross overcrowding and long waiting lists of the gynæcological departments, the absence of skilled treatment for abortions and other female ailments, and the great lack of maternity beds in general hospitals, accentuate the difficulties of local authorities in dealing with the situation. More help is needed for hospital committees, especially in such matters as the provision of new buildings, reconstruction, and developments. These details are sometimes dealt with by a committee without any expert assistance; this may prevent the subscribers' money being spent to the best advantage, and it would be to the benefit of the public if the situation were more widely recognised. It would be of great assistance to all those who have to administer such institutions if the Ministry of Health would provide a record office where a full description of all up-to-date institutions can be found, placed in the charge of some intelligent person who would be able, at short notice, to produce photographs, plans, and specifications of any new institutions that may be erected in any part of the world.

I had the opportunity of visiting a new hospital at Toronto six years ago, where it was the boast of the management that they had put into it everything that was good in any other institution in America or Europe, and they assured me it was exceedingly difficult for them to obtain the necessary information. One innovation appeared to be of great value. Instead of admitting accidents and emergencies at all hours of the day or night into the general ward and disturbing the rest of the hospital in consequence, they had a unit of about 30 beds with a separate theatre provided to deal with such cases, and this was found to be extremely valuable.

The Ancillary Services.

The provision of expert services would be incomplete without noticing the valuable help rendered by nurses and the women workers in nursing, massage, electrical and other departments, services which have made enormous strides during the war. Such services should be at the disposal of any general practitioner and patient that may need them. The utilisation of the service of the general practitioner in general hospitals needs careful consideration. It should be done as much as possible, though there are great practical difficulties. The general practitioner in the interests of the public ought not to undertake major surgical operations without expert medical assistance, but he ought to take part in this and other hospital work. The best solution of this problem would be the establishment of a number of out-patient clinics where this closer coöperation could be commenced. In small towns every medical practitioner ought to be admitted to the hospital staff as a means of preventing the curious anomalies that sometimes exist now. There should be beds where the general practitioner can deal with his patients in institutions, although we must not forget that if this work were provided for on a large scale some uniform and agreed system of dieting would have to be arranged. It may be said that all sections of the public seem to have a weakness for the irregular practitioner. One of the best methods of dealing with this matter is to make the public realise the very unsatisfactory nature of the services they render. Unfortunately, orthodox practitioners either from lack of opportunity or want of appreciation have not explored sufficiently such subjects as remedial exercises, massage, and manipulation, which are capable of rendering patients great assistance in keeping well and in curing their disease. In consequence, this sort of treatment has got chiefly into the hands of quacks who, with the imposing consulting-rooms and much ritual have undoubtedly gained the confidence of some of their patients by treatment which could have been provided to much better advantage by orthodox practitioners. Although in many instances the quack is a serious menace to public health, he is more difficult to deal with because he has been allowed in this way to stray into legitimate fields of treatment.

I have especially avoided going into too much detail, and have left the financial side of these questions severely alone, but wish to emphasise the necessity of providing a system to supply expert medical service of the best type to everyone needing it, as something that is absolutely necessary to maintain that working capacity, rather than as an act of charity. Although not recorded in any book, or capable of support by an array of figures available at this moment, we may be sure that there is a considerable amount of preventable and unnecessary suffering, premature death, and loss of working capacity and money, due to the want of organisation of our hospital system. We have learnt a great deal in the war which may be applied to these present problems. Such members of the public and the medical profession who study these questions (and they are rapidly increasing in number) are profoundly dissatisfied with the present state of things. The time is therefore ripe for reform, and it is for the medical expert to indicate clearly on what lines it may be most effectively carried out.

MEDICINE AND THE LAW.

The Proprietary Medicines Bill.

THE general policy of this Bill was explained and commented on in a leading article in THE LANCET last week, and it will have been gathered by readers that, except in the case of certain diseases, alleged remedies for which are not to be sold at all, it orders the registration of proprietary medicines and appliances, with full particulars of the articles in question. It does not appear to intend that the registration should in any case be refused for such a reason as that a medicine is not likely to produce the therapeutic effects claimed for it, but seems to contemplate the registration taking place if the prescribed regulations as to application for registration are complied with. The Minister of Health may, however, make regulations under Section 5 (*c*) "For prescribing the causes for which and the manner in which a registered owner may be removed from the register." In this and other respects the effect of the Bill cannot be properly estimated until it is passed, and then not until the regulations to be made under it have been acquiesced in by Parliament. Attention is here called to some of the principal provisions of the Bill as introduced and printed.

Sections 1, 4, 6, and 7 order the registration of proprietary medicines and appliances, and Section 5 defines in detail the formation and maintenance of the register, which is to be the subject of regulations. Two important sections of the Bill are, however, independent of regulations. The first of these which, it is proposed, should come into force six months after the commencement of the Act, declares that it shall not be lawful "for any person to sell or to offer or advertise for sale any medicine or surgical appliance of any kind whatsoever purporting or stated directly or by implication to be effective for the prevention, cure, or relief of any of the diseases or infirmities mentioned in the schedule to this Act." The schedule, which can be enlarged by regulation of the Minister, at present contains cancer, consumption, lupus, deafness, fits, epilepsy, amenorrhœa and other diseases peculiar to women, diabetes, paralysis, locomotor ataxy, Bright's disease, and rupture. It is to be noted that the proprietary medicines and appliances here forbidden to be sold include not only those where the owners propose to "cure" a scheduled disease, but also those which are put forward as effective to "prevent" or to "relieve" it. This makes the section extremely comprehensive, and it is one which will, no doubt, be criticised as such. The occasion, however, is not one for half measures, and an easy means for continuing the trade in various ineffective or dangerous compounds or articles would be provided if their owners

were merely prohibited from pretending to "cure" such diseases as those in the schedule.

The limiting words quoted above may be noted in connexion with the question of what medicines and appliances, if "proprietary," must be registered. Section 10, which contains the interpretation of expressions used in the Bill, defines "medicine" as including any drug, preparation, or compound to be used externally or internally for "the prevention, cure, or relief of any malady, ailment, infirmity, or disorder affecting human beings." It defines, on the other hand, a proprietary surgical appliance as "any instrument or contrivance of a medical or surgical nature which is recommended to the public by advertisement, label or otherwise in writing, as of use for curative purposes, and which is sold under a trade-name or a trade-mark to the use of which any person has or claims or purports to have an exclusive right, or for the making or selling of which any person has or claims or purports to have an exclusive right." It will be seen that unless a surgical appliance comes within Section 2, when its sale is forbidden, or is advertised as curing or tending to cure (which is presumably the meaning of "for curative purposes"), when it must be registered, it is not a "proprietary surgical appliance" within the meaning of the Bill. It seems clear that this will leave untrammelled the trade in many useful appliances, the manufacturers of which make no promises incapable of fulfilment, and have built up businesses to which none can reasonably object. The definition or interpretation, however, of the word medicine, quoted above, appears to introduce some possibility of doubt and difficulty, in that it may not always be plain whether that for which cure or relief is advertised is to be classified as a "malady, ailment, infirmity, or disorder." Drugs, for example, advertised as having the effect of making their consumers fatter or thinner can hardly be said to promise the relief of a malady in so far as they are offered to men or women dissatisfied with their physical attractions. Presumably, however, they may bring themselves within the contemplated law if they refer specifically to obesity or emaciation arising from disease, and hold out in their advertisements hopes for its cure or relief.

The other section referred to as not to be affected by regulations forbids absolutely the advertising of proprietary medicines or surgical appliances by the use of those devices which have become familiar in the past, and which, no doubt, have been found profitable by the vendors of useless or pernicious nostrums. The statement that the article advertised is recommended by a medical practitioner without full particulars of his identity is forbidden, inter alia, as is a false statement or suggestion that a medical practitioner first discovered, invented, or compounded the article advertised. It may be noted that the protection of the legitimate sale of medicines is provided for by Section 9 in the following terms: "Nothing in this Act shall operate to render unlawful the sale of any medicine or appliance to or for the use of any person in accordance with a prescription given in the case of that person by a duly qualified medical or dental practitioner." This seems to suggest that the sale of a medicine, not given under a prescription in the case of the person who will use it, will in future be unlawful. The practice of using prescriptions given to other persons exists, and is objectionable no doubt, and it is right that it should not be specifically protected. It must not, however, be taken as forbidden by the words quoted. The compound ordered in a prescription may be a medicine as defined in the Bill, but it can hardly become a "proprietary medicine" either according to the definition of "proprietary" or in the ordinary meaning of the word, merely because it is sold to a person for whom the prescription was not intended.

It will be interesting to watch the fate of some of the sections of the Bill when it comes to be discussed in detail in the House of Commons, but the Ministry of Health and the public will alike deserve congratulation if the measure passes without mutilation or destructive amendment.

An Ignorant Maternity Nurse.

At a recent inquest at Hackney on the body of the wife of a shipping clerk it was proved that the cause of death was blood poisoning following upon the confinement of the deceased. The medical man who had attended the deceased stated that he had found that the monthly nurse who had been engaged to attend the case had a finger in a septic condition, and he had accordingly dismissed her. He added that the woman in question had admitted to him that she had never passed any examination, and that she did not even know the meaning of the word "antiseptic." The coroner expressed surprise at such a person being employed and warned her upon her conduct, which, if she continued to attend such cases, might place her in a very serious position. He recorded a verdict of "Accidental death." If, as is to be gathered from the report of the case, the coroner was sitting alone, it would appear to have been one in which a jury might well have been summoned, and that the "nurse" was lucky in not having to face trial for manslaughter. The Nurses Registration Act, 1919, should, at any rate in future, operate to prevent such a person from securing registration under its provisions for an "existing nurse's" registration; to enable such a person to be removed from the register if upon it; or to prevent such a person, not being on the register, from calling herself or pretending to be a registered nurse. It will not prevent anyone from employing as a nurse in childbirth an ignorant, dirty, and unqualified person. It is gathered from the reports of the inquest above referred to that the "nurse" was engaged to act under a medical man and not as a midwife.

Prohibited Milk.

At Taunton County-Court a local dairyman recently brought an action against the town council for £100 damages for loss caused by the order which was enforced from Jan. 6th to Jan. 31st, prohibiting the admission of his milk into Taunton. Last November and December enteric fever broke out in the town, and it was discovered that out of 11 cases of the disease four had obtained their milk from the same retailer. This tradesman had his milk from three different sources, the plaintiff's dairy being one of them. Analysis of the milk showed that although there was no direct proof that the milk was a source of the disease, there was "gross contamination" from a dirt point of view, and consequently there was reasonable ground for enforcing the order. His honour (Judge the Honourable W. B. Lindley) dismissed the plaintiff's claim with costs, stating, in delivering judgment, that the order was made for the protection of the public, and prompt action was necessary by the council. This body acted upon the advice of the medical officer of health, who had formed his opinion with reasonable and sufficient care and evidence.

HOUSING NOTES.

The Conservation of Hygiene.

THE Ministry of Health is already laying plans against the obvious danger of degradation which the new hygienically-constructed houses will have to face. The cynic might be tempted to sneer, "First build your house. ....." He would be wrong in doing so, for, as has been shown in a recent number of *Housing*,[1] there is already much slum property which might be redeemed to afford decent living conditions by proper management. At Fulham, for example, there has been no rebuilding at all. Some women, trained on the lines laid down by Miss Octavia Hill, began to manage a few houses purchased by a private owner in this area about eight years ago, and the number has gradually increased to 60 or 70. The houses were shockingly overcrowded when first purchased by the present owner, with the sanitary fittings destroyed, the walls, ceilings, and floors badly damaged, windows broken and woodwork gone. There is a marked difference between the

[1] Housing, July 19th, 1920.

condition of recently acquired houses and that of others in the same neighbourhood which have been carefully supervised for six to eight years. From all this it emerges that the manager of property should be the person who receives the rent, and that he or she—preferably, it seems, she—should be a trained social worker, able to appreciate the needs and difficulties of the tenant without forgetting that the landlord must receive his interest. If the work is well done the manager will be popular, the tenants will become more self-respecting and therefore better tenants, while a good environment will be created for the social education of young householders, whose living habits are unformed. It is clear that a manager of property has a very responsible post. In order that suitable officers may be found a reasonable salary must be offered. The city of Amsterdam has been paying its chief woman manager a salary rising from £350 to £550. Her assistants, when fully trained, receive up to £291. These do not seem tempting salaries in our days, but the scheme is expensive. The municipality of Amsterdam, however, believes that the money so spent brings in a good return. Will English authorities be equally far-seeing?

The Myth of Loftiness.

The substitution of the kata-thermometer for the carbonic-acid index of ventilation has made necessary a complete revision of standards for the architecture of living rooms. This is brought out in an interesting manner in a short article by S. W. W.,[2] who effectually destroys our faith in the lofty ceiling. It is less important in view of modern knowledge to have high walls than to have high windows, and cubic space is best obtained by having a large floor area, so that the infections resident in the respiratory tract are less liable to pass from host to host.

[2] Ibid., June 21st, 1920.

The Output of Houses.

Progress in new construction is not rapid. It may be doubted whether we have yet reached a rate of output commensurate with the normal growth of population. Members of the Government have been in conference with representatives of the building trade, though no agreement appears to have been reached as yet. We believe that both sides are sincerely concerned for the public welfare and that such conferences must eventually bear fruit. The Government must realise, however, that with raw materials at their present price building will not progress rapidly, however many recruits are drafted into the industry. Increasing subsidies will some day become a serious drain upon the public purse. Dr. Addison stated in the House of Commons on July 15th that the high prices would be met by using alternative methods of construction. This is no real remedy. Many items such as lead piping will be common to all kinds of construction, and if a new wall material becomes popular experience shows that it will soon become expensive in proportion to its utility. The time will come when the price of building materials must be controlled as food prices were controlled during the war, and for the same reasons.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

METEOROLOGICAL OFFICE: ADVISORY COMMITTEE ON ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING

Feb. 29th, 1920.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar.	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	13	0·25	2·61	4·90	0·83	1·77	10·36	0·65	0·57	0·02
Archbishop's Park	16	0·09	0·98	1·29	4·10	1·93	8·39	0·99	0·29	0·05
Finsbury Park ...	14	0·09	0·81	2·14	0·73	1·72	5·48	0·83	0·27	0·04
Ravenscourt Pk.	10	0·04	0·80	2·33	0·93	1·90	6·00	0·97	0·20	0·09
Southwark Park	16	0·10	1·61	3·33	0·93	2·03	8·00	1·00	0·30	0·05
Victoria Park ...	16	0·04	1·30	2·72	0·75	1·60	6·42	0·67	0·37	0·03
Wandsworth Com.	11	0·03	0·35	0·97	0·65	1·45	3·44	0·69	0·27	0·03
Golden Lane*										
Birmingham—										
Central	26	0·09	2·52	7·22	1·55	2·69	14·07	1·55	0·22	0·04
Aston	30	0·08	1·86	5·35	0·68	2·65	10·62	1·23	0·22	0·03
South-Western ...	26	—	—	—	0·42	1·82	—	0·87	0·13	0·02
Kingston-upon-Hull	41	0·13	2·66	4·72	1·43	4·85	13·79	2·27	0·73	0·15
Malvern	18	—	0·07	0·20	0·26	0·77	1·32	0·36	0·05	Tr.
Newcastle-on-Tyne..	23	0·51	3·19	6·98	1·31	2·38	14·37	1·31	0·33	0·07
Rochdale	118	—	—	—	—	—	26·34	—	—	—
Rothamsted	11	—	0·44	0·39	0·92	1·52	3·27	—	—	—
St. Helens...	72	0·08	0·86	1·11	1·02	4·16	7·23	1·42	1·31	0·05
Southport—										
Hesketh Park ...	57	0·02	0·48	0·56	1·16	1·97	4·19	0·51	0·79	0·08
Woodvale Moss...	58	—	—	—	—	—	3·85	—	—	—
SCOTLAND.										
Glasgow—										
Alexandra Park ...	88	0·03	1·04	1·63	2·54	4·12	9·36	1·93	0·98	0·16
Bellahouston Pk..	97	0·04	0·51	1·11	3·81	4·24	9·71	1·68	1·43	0·05
Blythswood Sq. ...	126	0·09	1·09	1·74	4·83	5·51	13·26	2·38	1·52	0·15
Botanic Gdns. ...	121	0·06	0·68	1·15	2·83	4·83	9·55	2·53	1·14	0·11
Queen's Park ...	120	0·03	0·44	0·86	2·14	3·78	7·25	1·24	1·09	0·07
Richmond Park...	112	0·04	0·89	1·59	3·01	3·37	8·90	1·74	1·19	0·14
Ruchill Park ...	120	0·07	0·72	1·14	3·42	4·58	9·93	1·77	1·18	0·12
Tollcross Park ...	104	0·10	1·24	2·24	2·99	4·69	11·26	2·05	1·21	0·09
Victoria Park ...	119	0·03	0·77	1·28	3·33	4·91	10·32	1·39	1·31	0·11

March 31st, 1920.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar.	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	28	0·26	2·53	6·95	1·34	2·13	13·21	0·67	0·73	0·03
Archbishop's Park	31	0·12	3·36	4·82	1·56	3·50	13·35	1·66	0·42	0·10
Finsbury Park ...	33	0·10	1·36	4·84	0·93	2·39	9·63	0·98	0·41	0·03
Ravenscourt Park	25	0·09	0·44	1·47	1·08	2·51	5·60	1·32	0·26	0·11
Southwark Park	36	0·08	1·56	3·74	1·16	2·55	9·09	1·25	0·43	0·07
Victoria Park ...	36	0·10	1·46	3·54	0·65	1·90	7·64	0·62	0·50	0·03
Wandsworth Com.	27	0·07	1·45	4·59	0·80	2·09	8·99	0·82	0·38	0·05
Golden Lane ...	33	0·07	3·30	5·15	0·79	2·75	12·05	1·06	0·81	0·14
Birmingham—										
Central	69	0·09	3·97	11·82	1·66	3·96	21·50	2·06	0·45	0·07
Aston	62	0·08	2·13	7·32	1·48	3·47	14·48	1·67	0·34	0·05
South-Western ...	75	0·04	0·62	1·92	0·67	2·77	6·02	1·24	0·22	0·05
Kingston-upon-Hull	54	0·12	2·11	3·81	1·82	4·04	11·90	2·06	1·07	0·05
Malvern	87	—	0·20	0·23	0·59	1·54	2·57	0·77	0·15	0·02
Newcastle-on-Tyne	70	0·47	4·18	8·22	2·80	3·08	18·74	2·25	0·40	0·11
Rochdale	—	—	—	—	—	—	35·34	—	—	—
Rothamsted	34	—	0·66	0·49	1·21	1·34	3·70	—	—	—
St. Helens...	90	0·21	1·34	2·80	0·41	26·16	30·92	2·15	1·44	0·07
Southport—										
Hesketh Park ...	97	0·06	0·58	0·70	1·70	1·94	4·98	0·89	0·87	0·09
Woodvale Moss...	87	—	—	—	—	—	5·30	—	—	—
SCOTLAND.										
Glasgow—										
Alexandra Park...	82	0·05	1·35	2·25	3·61	3·95	11·21	1·63	0·82	0·12
Bellahouston Pk.	75	0·06	0·73	1·33	1·68	1·71	5·51	0·67	0·88	0·07
Blythswood Sq. ...	89	0·10	0·81	3·50	3·06	4·38	11·85	1·82	0·83	0·14
Botanic Gdns. ...	96	0·09	1·16	2·52	3·91	3·47	11·15	1·68	0·82	0·13
Queen's Park ...	97	0·07	0·52	1·42	2·06	2·66	6·72	1·30	0·85	0·09
Richmond Park...	94	0·08	1·10	3·99	3·11	1·72	10·00	1·24	0·86	0·14
Ruchill Park ...	105	0·08	1·49	2·50	1·70	2·64	8·41	2·05	0·94	0·14
Tollcross Park ...	93	0·15	1·09	2·92	2·13	1·68	7·97	1·75	0·76	0·09
Victoria Park ...	101	0·35	0·90	2·97	4·00	4·34	12·56	2·10	0·95	0·12

* There were no returns from the station at Golden Lane in London during February owing to the gauge being under repair, and there were no returns from Stirling for both February and March.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) 1 g. per sq. metre; (*d*) 1/1000 mm. of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables. The analyses of the rain and deposit caught in the gauge at the Meteorological Office are made in THE LANCET Laboratory.

Correspondence.

"Audi alteram partem."

THE PHARMACIST AND THE PROPRIETARY MEDICINES BILL.

To the Editor of THE LANCET.

SIR,—In approaching the Proprietary Medicines Bill from the standpoint of the pharmacist, I must first of all express the regret that one of the most brilliant members of the pharmaceutical profession of our time, and the one whose patient work perhaps did more than that of any other man to enlighten the public mind on the follies of quackery, has not lived to see his efforts so near fruition. I refer to the late Lieutenant-Colonel E. F. Harrison, who before working himself to death in order to find means of protection for our troops against the German poison gases, devoted years of his life to unravelling the secrets of secret remedies and so demonstrating how the vast majority of the population of this country was being fooled by a handful of nostrum mongers. *Omne ignotum pro magnifico.* After Harrison had finished his labours there was little left to be known about the secrets of the quacks.

It will be understood that these references to quackery do not embrace every maker and vendor of proprietary medicines; probably scores of proprietary articles could be enumerated which not only do not merit condemnation, but are almost as good as they are claimed to be. The class of compound I have especially in mind in making this reservation is that which depends for its vogue on some special manipulative method which makes the medicine superior in one way or another to others of its kind, and is as different from the offensively advertised "cure-all" as chalk is from cheese.

If proprietary medicines had been confined to the better type, or even to such as are made in almost every pharmacy in the country, it is possible that restrictive legislation would not have been needed. What made the business an offence to public decency was the long and rapidly lengthening list of worthless mixtures, pills, and salves, foisted on a credulous people by men of the get-rich-quick type, who knew nothing and cared nothing about the properties of drugs so long as they brought grist to the mill. As I read the provisions of the Bill, there is nothing in it to prevent any man from turning an honest penny, but if it does not prevent the public from being fooled it will fail in its purpose.

Coming to the details of the measure as they affect the conduct of the maker or vendor of proprietary medicines, the most noteworthy provision is that which prohibits the sale of alleged cures for cancer, consumption, deafness, fits, epilepsy, amenorrhœa and other diseases peculiar to women, diabetes, paralysis, locomotor ataxy, and rupture. I have yet to meet the pharmacist who would deny that it is wrong to sell "cures" for incurable diseases, and if that description of the object of the provision is hardly complete, I hasten to add that I have met no pharmacists who would not admit the justice of putting a stop to the exploitation of persons suffering from any one of these diseases. Next in importance comes the provision that the composition of proprietary medicines must be disclosed in confidence to the Registrar in a Government department. That the notorious quack will find many specious reasons why he should not do this there is not the least doubt, but with him we are not concerned. Will the pharmacist object? I do not think so. Some years ago, following a new interpretation of one of the sections of the Medicine Stamp Act, practically all the pharmacists in practice in Great Britain disclosed some of their most prized formulæ, and had them printed in a book that ran into thousands of copies. Is it likely that a pharmacist who will publish the names of the ingredients of his compounds for all the world to see will object to have them placed in the hidden archives of the Ministry of Health?

There is, however, one provision to which pharmacists may possibly take exception—namely, that which makes it an offence for anyone selling a proprietary medicine to enclose within the wrapper an advertisement of another proprietary medicine. In whose interest this is made an offence I do not know, but it is certainly not in the interests of the public, since we find nothing in the Bill to prohibit the advertising of proprietary medicines in the public press, with the exception of medicines for the diseases specifically named. As a matter of fact, this clause has already been withdrawn. Another objection which pharmacists may raise is that the Minister should not have the power to add to the schedule of diseases remedies for which may not be sold.

Finally, it should be remembered that proprietary medicines are almost as old as the hills, and that reasons against the interference with the immemorial way of life must be heard with patience. A lesson may be learned from the Australian Royal Commission, on the results of whose inquiry into secret medicines the law affecting their sale in Australia was based. This Commission made a strong point of the fact that while in England makers of feeding-stuffs for animals and manures for the ground must disclose the composition of these articles, the English law allowed human beings, whether babies or adults, to be dosed with secret compounds. Unless it is proved that cattle and turnips are more precious than human lives, an answer will have to be found to the remonstrance.

I am, Sir, yours faithfully,

August 10th, 1920. PHARMACEUTICUS.

THE TREATMENT OF ACUTE INFECTION OF THE KNEE-JOINT BY ACTIVE MOVEMENT.

To the Editor of THE LANCET.

SIR,—The allusion in your annotation of July 10th (p. 81) to this method of treatment reminds me of a series of cases which I treated when in France. Willems's method, in my hands, gave only a small measure of success, because I was unable to persuade the patients to carry out the movements unaided. I therefore designed a contrivance which, by means of a mobile splint and counter-weights, overcame the force of gravity. By this the movements were made as easy as possible, and the initial pain and weakness did little to hinder them.[1] The immediate effect was striking. After the first day or two pain was definitely eased by active movement, tracking appeared to be prevented, and the vascularity of the limb was maintained. During treatment the joint secretion tended in two or three weeks to become clear, resembling normal synovial fluid, and the wounds rapidly granulated and healed.

I ascribe the beneficial effect not only to the mechanical expression of pus by the movements, but also to the maintenance of a good blood-supply. In a part functionally at rest the blood tends to stagnate, especially in the lower extremity, where venous return is largely dependent upon muscular activity. Given a good blood-supply, a synovial secretion more potent in its bactericidal property is reasonably to be expected. This property appears to be maintained, provided that the fluid is prevented from stagnation by arthrotomy in the more severe cases, or by aspiration in the milder.

Several of my cases bore a marked resemblance to that published by Dr. F. B. Lund. Of a series of 23 septic knee-joints which I treated in this way, 11 obtained good mobile joints; 1 only was amputated, and that for other reasons. Though in civil practice we are not often confronted with the problem of the infected knee, I have had a few instances where the principles evolved, as the outcome of experience gathered during the war, have been further established. For example, a girl of 6 was admitted under my care into King's College Hospital, having run a rusty needle into her knee-joint. In three days the joint had become distended with a fluid which was found on aspiration and examination to be rich in pus cells and staphylococci. Three aspirations, combined with active move-

[1] A New Method of Treatment for Suppurative Arthritis of the Knee-joint, British Journal of Surgery, April, 1919.

ments, brought about complete resolution in three weeks, and she left hospital walking perfectly. Such a case would, I think, undoubtedly have been treated by the majority of surgeons in pre-war days by wide incisions and drainage-tubes placed in the synovial cavity. The results of such treatment are too well known to require description.

The rarer form of gonorrhœal arthritis—namely, synovitis with effusion—I have recently been treating in a similar fashion by aspiration with active movements. The result has been stimulating to further endeavours. I am, Sir, yours faithfully,

JOHN EVERIDGE.

Upper Wimpole-street, W., August 3rd, 1920.

EMBOLIC ANEURYSM OF PERIPHERAL ARTERIES.

To the Editor of THE LANCET.

SIR,—In your interesting annotation dealing with the communication by Mr. Douglas K. Adams on Embolic Aneurysm of Peripheral Arteries, which appeared in the *Glasgow Medical Journal*, you refer to the critical review on bacterial endocarditis by Irving Simons, published in the *Quarterly Journal of Medicine* for April, 1914, as giving "a list of the recorded cases of embolic aneurysms." This list is not, of course, confined to "peripheral" aneurysms; it is intended to include those found in other vessels, such as the branches of the cœliac axis and the renal and cerebral arteries. The list is prefaced by the remark: "The distribution of embolic aneurysms is of extreme importance," and in a note following his table the writer says: "These cases are all that I have been able to find in the literature."

I have always regarded the omission from Simons's review of any reference to aneurysm of the coronary arteries of the heart as a serious flaw in his admirable contribution to our knowledge of bacterial affections of the endocardium. In the *British Medical Journal* of Feb. 2nd, 1901, in putting on record two cases of embolic aneurysm of the coronary arteries of the heart, associated with infective endocarditis, I gave a list of all the cases of aneurysm of those vessels which I had been able to collect from the literature. Although it is not likely that this list was a complete one, it dealt with 24 instances, including my own two, the earliest of these being that which was put on record by Bougon in 1812. I was able to read the original account of 18 of these, and I found that in six of them infective endocarditis was seen on autopsy. This is, of course, strong presumptive evidence that the aneurysms were embolic, and in discussing the remaining 12 cases I gave what I considered good reasons for thinking that most of them also were due to this cause.

Subacute infective endocarditis is an affection which appears to be on the increase. Its frequency during the war was very striking and it may be that its continued frequency is an aftermath of war. I would urge that every opportunity be taken by those who are engaged in making autopsies in cases of infective endocarditis to include a careful examination of the coronary arteries for embolism. If the common cause of aneurysm of the coronaries in infective endocarditis is indeed embolism, the proof of this will be found not in the demonstration of an embolon in association with the aneurysm, for an embolon may well have disappeared after the infection of the arterial wall has led to softening and dilatation, but in the frequency of coronary embolism being shown to be greater than is usually supposed. It is a remarkable coincidence that the two cases of coronary aneurysm I put on record were seen in autopsies done by me on the same day, and that the next autopsy I performed was also on a case of infective endocarditis in which the patient had died suddenly, and in which I found both coronary arteries plugged by detached vegetations.

One of the points I desired to emphasise in my paper of 1901 was the probability of aneurysms of the coronary arteries "sharing the peculiarity of aneurysms on small vessels elsewhere in being embolic in origin."

I am, Sir, yours faithfully,

Leeds, August 9th, 1920. T. WARDROP GRIFFITH.

STANDARD ARTIFICIAL LIMBS.

To the Editor of THE LANCET.

SIR,—I notice in your issue of July 31st that you have published an article on Standard Artificial Limbs, and I am surprised that the information you have received has not any reference to the services rendered to the Ministry of Pensions by the British Artificial Limb Makers' Association.

Throughout the whole of the work of devising standard artificial limbs a large proportion of the research and experience necessary to arrive at satisfactory solutions of difficult problems devolved upon the British Artificial Limb Makers' Association, and Sir Charles Kenderdine has acknowledged at more than one meeting of the Advisory Council to the Ministry to what a large extent the work has been indebted to the Association for assistance and suggestions. The Limb Makers have combined to place their experience at the disposal of the Ministry to arrive at the most satisfactory forms of limb for standardisation, and I shall feel greatly obliged if you will accord the same publicity to this letter as to the article referred to.

I am, Sir, yours faithfully,

W. R. GROSSMITH,

Honorary Secretary, British Artificial Limb Makers' Association.

12, Burleigh-street, London, W.C. 2, August 6th, 1920.

URBAN VITAL STATISTICS.

(Week ended August 7th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·9, 9·8, and 9·9 in the three preceding weeks, fell last week to 9·6 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·1, or 0·4 per 1000 below that recorded in the previous week, while among the remaining towns the rates ranged from 2·7 in Enfield, 4·3 in Ealing, and 4·9 in Walthamstow, to 15·4 in Bury, 16·3 in Stockton-on-Tees, and 17·2 in Hastings. The principal epidemic diseases caused 168 deaths, which corresponded to an annual rate of 0·5 per 1000, and comprised 87 from infantile diarrhœa, 28 from diphtheria, 22 from measles, 17 from whooping-cough, 9 from scarlet fever, and 5 from enteric fever. Measles caused a death-rate of 2·0 in Aberdare, but the mortality from the remaining diseases showed no marked excess in any of the towns. There were 2022 cases of scarlet fever and 1469 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 1956 and 1481 respectively at the end of the previous week. The causes of 34 of the deaths in the 96 towns were uncertified, of which 8 were registered in Birmingham and 4 in Hull.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 11·1, 11·6, and 11·2 in the three preceding weeks, fell to 11·1 per 1000. The 256 deaths in Glasgow corresponded to an annual rate of 11·1 per 1000, and included 8 from infantile diarrhœa, and 2 each from small-pox, measles, diphtheria, and whooping-cough. The 56 deaths in Edinburgh were equal to a rate of 8·6 per 1000, and included 1 from infantile diarrhœa.

Irish Towns.—The 107 deaths in Dublin corresponded to an annual rate of 13·4 per 1000, or the same as that recorded in the previous week, and included 4 from whooping-cough, 3 from infantile diarrhœa, and 1 each from enteric fever and diphtheria. The 95 deaths in Belfast were equal to a rate of 12·4 per 1000, and included 10 from infantile diarrhœa, 2 from scarlet fever, and 1 each from enteric fever, measles, and whooping-cough.

ROYAL COLLEGE OF PHYSICIANS, EDINBURGH: DR. JESSIE MACGREGOR PRIZE.—The trustees of the Dr. Jessie Macgregor Prize announce the award, for the present triennial period, to Miss Lucy Davis Cripps, M.B.E., M.B., Ch.B. Edin., for her work on tetryl. The prize, which is open to medical women graduates of Edinburgh University or to women who have taken the triple qualification, is given to the applicant who presents the best record of original work in the science of Medicine, done not earlier than three years prior to the date of the award.

The Services.

ROYAL ARMY MEDICAL CORPS APPOINTMENTS.

A RECENT Army Order provides that medical practitioners who are required for service in an emergency shall be commissioned into the Special Reserve or Territorial Force, under the same conditions of service and the same rates of emoluments as apply to officers of those forces; and that, in the event of it being found necessary to grant temporary commissions, officers to whom such commissions are granted shall not receive more advantageous emoluments than those applicable to officers of the Special Reserve and Territorial Force.

Officers of the Special Reserve or Territorial Force who have passed through a Royal Army Medical Corps unit of the Officers Training Corps will be granted, on first appointment to the Special Reserve or the Territorial Force, seniority of six months if they have by examination obtained Certificate B (Medical), and seniority of three months if they have obtained Certificate A (Medical).

On mobilisation officers who have obtained Certificate B or Certificate A will be considered for appointments in preference to those not so qualified.

ROYAL NAVAL MEDICAL SERVICE.

The commissions of the following officers have been terminated from August 1st, 1919, the date of their being granted permanent commissions in the R.A.F.: Surg. Cmdrs. H. V. Wells, C. E. C. Stanford, A. W. Iredell, H. Cooper; Surg. Lieut.-Cmdrs. A. V. J. Richardson, W. A. S. Duck, A. E. Panter.

Surg. Capt. C. S. Woodwright to be Surgeon Rear-Admiral.

Surgeon Lieutenants to be Surgeon Lieutenant-Commanders: R. A. W. Ford, C. H. M. Gimlette, W. H. A. Sinclair-Loutit, W. J. Gerrard, R. Buddle, W. P. Vicary, A. C. Shaw, R. K. Shaw, R. A. Brown, A. C. V. Green.

Surgeon Lieutenants (Dental) to be Surgeon Lieutenant-Commanders (Dental): G. E. Wood, J. R. Palmer, W. C. Murray, E. E. Fletcher, F. Thompson, J. F. Place, D. Paterson, R. R. Adams, T. A. B. Corless, J. S. F. Horton, H. M. Meek, P. G. Richards, A. Lawrey, B. J. Geekie.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. E. E. Ellery retires on retired pay.

Majors relinquishing the acting rank of Lieutenant-Colonel: G. H. Stevenson, T. H. Scott (Bt. Lieut.-Col.) J. M. H. Conway.

Majors retiring on retired pay: G. Baillie (on account of ill-health contracted on active service), R. N. Woodley.

Captains to be Majors: (Bt. Majors) C. Ryles, W. E. Marshall, T. J. Mitchell, W. G. Wright, A. J. T. McCreery, S. W. Kyle, D. S. Buist, A. M. Pollard, G. G. Collet, C. Clarke, (Temp. Majors) E. W. Vaughan, G. S. Parkinson, A. N. R. McNeill, A. R. Wright (and to be Brevet Lieutenant-Colonel), T. B. Nicholls, J. B. Jones, J. A. Clarke, S. McK. Saunders, (acting Major) D. H. C. MacArthur, H. Gall, C. H. O'Rorke, J. Startin, G. H. Stack, H. H. Leeson, J. W. Lane.

To be acting Majors: Temp. Capts. E. G. M. Gilchrist, D. Miller.

The undermentioned relinquish the acting rank of Major: Capts. H. R. L'Estrange, A. L. Aymer, H. G. Robertson, H. C. Todd, W. McM. Chesney, F. P. Rankin; Temp. Capts. D. Gillespie, A. H. Greg.

Capt. J. F. W. Meenan, from Special Reserve, to be Captain.

Capt. D. J. H. Jones, from Special Reserve, to be Lieutenant and to be temporary Captain.

Officers relinquishing their commissions: Temp. Lieut.-Col. A. Lingard (and retains the rank of Lieutenant-Colonel), Temp. Capt. H. R. L. Joy (and is granted the rank of Major). Temporary Captains retaining the rank of Captain: S. J. W. Donald, C. L. Driscoll, W. A. Hotson, F. H. Whyte, H. Stewart, H. H. Crickitt, W. H. Booth, N. Purcell, G. L. Neil, W. A. Higgins.

SPECIAL RESERVE OF OFFICERS.

Capt. C. J. Rogerson relinquishes the acting rank of Lieutenant-Colonel.

Capt. T. C. Storey relinquishes the acting rank of Major.

The undermentioned Captains relinquish their commissions: J. J. McI. Shaw (and is granted the rank of Major), J. W. Gray, and I. L. Waddell (retain the rank of Captain).

TERRITORIAL FORCE.

Capt. J. E. Lascelles resigns his commission and retains the rank of Captain.

ROYAL AIR FORCE.

Medical Branch.—Capt. P. McDiamid is transferred to unemployed list. Capt. J. B. Barnett relinquishes his commission on ceasing to be employed, and is permitted to retain his rank.

Dental Branch.—Flying Officer R. H. Moore to be Flight Lieutenant.

INDIAN MEDICAL SERVICE.

Capt. A. A. C. McNeill to be Major.

Maj.-Gen. Patrick Hehir, C.B., C.M.G., C.I.E., I.M.S., has been promoted to be a Knight Commander of the Most Eminent Order of the Indian Empire for services during the operations against Afghanistan.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Reform in the Law of Death Certification.

A JOINT deputation representing the British Medical Association and the medical Members of the House of Commons was received on Tuesday, August 3rd, by Mr. SHORTT (Secretary for Home Affairs) and Dr. ADDISON (Minister of Health) on the question of reform in the law relating to death certification and the procedure of coroners' courts. Mr. BISHOP HARMAN, who presented the case on behalf of the deputation, said the present system of death certification was valueless from the scientific point of view. He urged that death certificates should be in duplicate, one half indicating the fact of death and the other—a private document—should give the actual cause of death. Registration was carried out so loosely at the present time that numerous bodies were buried without being certified by a medical man or made the subject of a coroner's inquest. The object of the coroner's court of inquiry was really to determine the cause of death, and therefore the coroner ought to be a medical man. Mr. HARMAN suggested that he would prefer an officer similar to the Procurator Fiscal in Scotland. The Home Secretary interposed to say that that was according to French law, and in England they regarded the French law as bad. As to the suggestion that the coroner should always be a medical man, Mr. SHORTT said that if that were proposed no doubt the Government would have a deputation of lawyers urging that the coroner should always be a lawyer. Mr. HARMAN went on to argue that the fees provided for medical men who conducted post-mortem examinations and for their attendance at inquests were entirely inadequate. This point was sympathetically received by the Home Secretary. Dr. FARQUHARSON, M.P., pointed out that certain coroners, in accordance with the Act of 1914, conducted private inquiries which saved the cost of an inquest. He suggested that in such cases the coroner should be compelled before granting the right of burial to receive a written statement from a medical man giving his opinion as to whether death was due to natural causes or whether there was suspicion of violence. Dr. ADDISON said that he thought the point was a most important one, and the Home Secretary was sympathetic to a change in the law in this direction. Neither of the Ministers, however, held out any hope that legislation would be introduced on the lines suggested by the deputation.

HOUSE OF LORDS.

FRIDAY, AUGUST 6TH.

Proprietary Medicines Bill.

On the motion that the House go into Committee on the Proprietary Medicines Bill,

Lord BLEDISLOE expressed the hope that no attempt would be made to whittle down the important provisions of the measure. Never had such a tissue of fraud and falsehood been disclosed as was disclosed before the Select Committee in regard to some of these proprietary preparations. Through advertisements in the less reputable section of the newspaper press deception was practised on credulous persons of the servant girl and shop assistant class. In no civilised country in the world was less protection afforded than in the United Kingdom against the class of medicine with which this Bill dealt.

Viscount ASTOR (Parliamentary Secretary to the Ministry of Health) said one of the main objects of the Bill was to protect the health of the public. They had not attempted to deal with profiteering.

The House then went into Committee on the Bill, the Earl of DONOUGHMORE in the chair.

On Clause 1, which provides for the control of the manufacture and sale of proprietary medicines and appliances,

Lord EMMOTT moved to leave out the provision that the ingredients and composition of a proprietary medicine should be set forth on the proposed register of medicines and appliances. Such a provision, he said, might lead to the disclosure of the ingredients to a rival manufacturer. He moved to substitute instead a statutory declaration furnished to the register that the patent medicine was compounded of the ingredients mentioned in the declaration. In the opinion of the manufacturers of these medicines some members of the medical profession were "out" to destroy their trade, with the incidental effect of increasing their own earnings. He, however, was not concerned with that quarrel. His desire was to see justice done to the public. The medicines which were mainly intended for export were harmless syrups, which, like the present Coalition Government, exercised a soothing effect upon a considerable proportion of the country.

Viscount ASTOR resisted the amendment on the ground that it would strike out of the Bill one of its most important provisions. He contended that the administration of the measure would not require a large staff of officials. There was no doubt that sick persons in some cases got worse through treating themselves with proprietary medicines and neglecting the consultation of a medical man. There might be ingredients in proprietary medicines which were not poisonous, but which, if taken in excessive doses, did in fact injure the health of those who took them. He did not, however, wish to create a prejudice against patent medicines generally, or to suggest that all these proprietary remedies were injurious.

Lord DAWSON of PENN pointed out that the Bill would protect the public from combinations of drugs that might be harmful.

Lord RIDDELL urged that they were dealing with a very big business in which millions of capital were involved. The taking of patent medicines was a recreation with many people. He did not suppose that patent medicines had a monopoly of poisoning. People had been poisoned by doctors and otherwise. It was most important in the interest of the public that a careful measure should be devised, and he did not regard the present Bill as such a measure, more particularly in its provisions with respect to registration.

Viscount ASTOR said that the Ministry of Health did not wish to do anything that would harass the public, or injure the legitimate interests of the trade. The Ministry would do everything it could to ascertain what the trade had to say with a view to additional safeguards being introduced if they were found to be necessary. It was, however, right that the ingredients of these preparations should be disclosed confidentially to the Ministry.

The amendment was withdrawn.

On Clause 3, which deals with offences in connexion with the advertising of these remedies, an amendment moved by Lord EMMOTT to delete paragraph (a), which provided that a person should be guilty of an offence if he enclosed with or in the parcel or wrapper containing a proprietary medicine or surgical appliance any written matter (not being an ordinary trade catalogue) advertising the use of another proprietary medicine or surgical appliance, was agreed to.

Viscount ASTOR moved an amendment to Clause 4 (registered medicines and appliances), providing that the Registrar should not furnish any copy of extract from any formulæ relating to any registered medicine to any person other than the registered owner.

The amendment was agreed to.

Lord BLEDISLOE moved an amendment to Clause 5, which deals with regulations, requiring that in the case of any synthetic drug sold as a proprietary medicine the chemical name should appear on the label and in every advertisement relating to it.

The amendment was agreed to.

On the motion of Lord BLEDISLOE, it was also agreed to increase the maximum amount of the fine for a misdemeanour under the Bill from £100 to £500, and for any other offence under its provisions from £20 to £50.

The remaining clauses of the Bill were passed without amendment, and the measure as amended was then reported to the House.

HOUSE OF COMMONS.

WEDNESDAY, AUGUST 4TH.

Cost of the Housing Shortage.

Mr. BRIANT asked the Minister of Health if he would state what was the total sum of money required to make good the shortage of houses in the United Kingdom; and how was it proposed to provide this sum.—Dr. ADDISON replied: At present prices I estimate that the capital sum required to make good the shortage of houses will amount to approximately £120,000,000 a year. I hope that the sum needed will be provided as it is required by the investment of their savings by the people of this country.

Shortage of 800,000 Houses in England and Wales.

Major ENTWISTLE asked the Minister of Health if he would state what was now the total estimated shortage of houses in the United Kingdom.—Dr. ADDISON replied: Housing in Scotland and Ireland does not come within the purview of my department, but in England and Wales the total estimated need as disclosed by surveys made by local authorities in pursuance of Section 1 of the Housing Act, 1919, amounted in gross to 800,000 houses, taking account of replacements of existing unsatisfactory houses.

Soldier's Death at Edmonton Infirmary.

Sir PHILIP PILDITCH asked the Secretary for War if he proposed to give effect to the verdict of the coroner's jury in the case of the death of Private George William Henry Elsley, at Edmonton Infirmary on July 9th, calling upon the military authorities to hold an inquiry, which verdict had been conveyed to the War Office.—Mr. CHURCHILL replied: This case is still the subject of investigation by the military authorities, and I will let the honourable Member know the result as soon as possible.

Pensions of Dependents of Indian Officers.

Colonel YATE asked the Secretary of State for India if he could now state what decision had been arrived at on the subject of an increase in the pensions of the widows, children, and dependents of deceased officers of the Indian Army, the Indian Medical Service, and the Royal Indian Marine.—Mr. MONTAGU replied: So far as the widows, children, and other dependents of officers of the Indian Services who lost their lives in the Great War are concerned the benefits admissible have been substantially improved by the Warrant of July 2nd, 1920, the main provisions of which will be applied to the Indian Services. As regards the dependents of officers who died before the war, or whose death was not due to service in the war, I much regret that it has not yet been possible to come to a decision, as it has been necessary to take into consideration the effects of the provisions of the Pensions Increase Bill which is now before the House. I can assure my honourable and gallant friend that I will do all in my power to expedite a decision.—Colonel YATE: Does the decision on this matter rest on the passing of this Bill now before the House, or when will a decision be come to?—Mr. MONTAGU: No, it does not rest on the passage, but it does rest on the consideration of these provisions.—Colonel YATE: Can the right honourable gentlemen say when these provisions will be considered?—Mr. MONTAGU: We are considering the matter now. It is very urgent to come to an immediate decision, and I am trying to get a decision as quickly as possible.

THURSDAY, AUGUST 5TH.

Women and the Welsh Board of Health.

Major BREESE asked the Minister of Health whether, in the selection of members to serve on the Board of Health for Wales, he proposed to appoint one or more women; and, if not, would he state the reason.—Dr. ADDISON replied: I can assure the honourable and gallant Member that the question of appointing a woman member of the Welsh Board of Health has received my serious consideration, but as it is probable that the number of members already appointed will be found sufficient for the work I do not consider that it would be justifiable to add to that number at the present time.

Sports Associations and the Open Spaces Bill.

Mr. JOHN DAVISON asked the Lord Privy Seal whether he was aware that sports associations throughout the country were desirous of sending a representative deputation to him to urge the necessity in the interests of the health and recreation of the people of the passage of the Open Spaces Bill; and whether he would receive the deputation at an early date in order to ascertain from them the volume of opinion in favour of the Bill and of its early passage into law.—Mr. BONAR LAW replied: I doubt whether any useful purpose would be served by receiving a deputation on this subject, but I shall discuss it with my right honourable friend, the Minister of Health, whose department is concerned in it, and let the honourable Member know whether it is possible for my right honourable friend or myself to receive the deputation.

MONDAY, AUGUST 9TH.

Conditions of Hospital Probationers.

Viscountess ASTOR asked the Minister of Health whether his attention had been drawn to the conditions under which nursing probationers in many London hospitals at present worked, especially with regard to housing accommodation and hours and conditions of duty; and whether he would consider recommending reforms in these connexions to all hospitals in receipt of State grants for the benefit both of probationers and of the nursing profession generally.—Dr. ADDISON replied: I am fully aware of the unsatisfactory conditions under which many probationer nurses are at present employed, and any steps which the General Nursing Council may propose to remedy this state of affairs will have my sympathetic consideration. State grants, however, are only paid in respect of the treatment of certain specified diseases, and I do not think it would be practicable to attach to them conditions such as the honourable Member suggests.

Facilities for Visiting Service Men in Hospitals.

Mr. W. H. SMITH asked the Minister of Transport whether he was aware that a large number of soldiers still in hospital at a distance from their homes were without the necessary means to enable them on occasion to visit their families, and that the members of their families for the same reason are unable to visit the hospitals; and whether he would consider the possibility of these men or their families being granted travelling facilities at cheap rates.—Sir ERIC GEDDES replied: I have every sympathy with the case of soldiers still in hospital and their desire to see their families. I am not, however, in favour of piecemeal concessions. The treatment of disabled soldiers and sailors must

be regarded as a whole, and I do not think any portion of the cost should in an indirect way be borne by the Railway Agreements Vote. It is a matter for the War Office, Minister of Labour, or Minister of Pensions, not for the Minister of Transport.

TUESDAY, AUGUST 10TH.

London University Site.

Mr. LORDEN asked the Chancellor of the Exchequer whether, as the Senate of London University had not accepted the offer of the Government of a site in Bloomsbury, he would say if, in the event of the Senate of London University approving Kenwood, Highgate, as a suitable site for the University, the Government would provide similar financial aid equal to the cost of the Bloomsbury site.—Mr. CHAMBERLAIN replied: No, Sir. The offer of the Bloomsbury site afforded the Senate an opportunity of establishing the University close to the British Museum with its unrivalled facilities for students and of collecting in one group the central buildings of the University and its principal constituent colleges. The purpose of the offer was to enable the University to rise to the high level of its opportunities and duties as the Metropolitan University of the Empire. This purpose would not be secured by the selection of another site not affording the same facilities, and H.M. Government would not feel justified in calling upon the general taxpayer for such an extraordinary contribution upon any other grounds.

Prison Medical Officers.

Mr. HANCOCK asked the Home Secretary whether he would consider the desirability of the transfer of the prison medical service to the Ministry of Health and of prison education to the Board of Education.—Mr. SHORTT said in reply: The arrangements for maintaining the health of prisoners and providing means of education are intimately bound up with general questions of prison administration, and it is most undesirable that the responsibility for this should be divided between three separate departments of Government.

Assaults upon Children.

Viscountess ASTOR asked the Home Secretary whether he was aware of the increase in the number of cases of criminal or indecent assaults on children; and whether, in view of the seriousness of the offence, he would consider the advisability of taking steps so that the sentences which could be imposed under summary jurisdiction should be increased, or that all such cases should be tried before a superior court.—Mr. SHORTT replied: No evidence of any general increase in the number of assaults on children has been brought to my notice. If the honourable Member will let me have any evidence on this point that she may have in her possession I will consider the matter further.

Medical Officers in the Colonial Service.

Lieutenant-Colonel FREMANTLE asked the Under Secretary for the Colonies whether there was at present a shortage of medical officers in the Colonial Service; whether this was an obstacle to the health and development of the colonies, and was largely due to the comparative unattractiveness of the Service; whether he had now received and would publish the report of the Committee which had recently investigated the subject; and would he state in what way and how soon he proposed to introduce the required and obvious remedies.—Colonel AMERY replied: I am aware that the shortage to which my honourable friend refers does exist, and that it is by no means confined to the Colonial Service. Improvements in the pay of medical officers have already been carried out in the majority of colonies and protectorates. The Secretary of State has recently received the report of the Committee referred to. It requires careful consideration, and I am not yet in a position to say what action will be taken upon it or whether it will be published.

Director-General of the Army Medical Service.

Lieutenant-Colonel FREMANTLE asked the Secretary for War whether he had considered the advisability of guarding against the breakdown of medical arrangements and of securing greater physical efficiency in military operations by placing the Director-General of the Army Medical Service on the Army Council with responsibility and power to secure the full consideration of health matters and the execution of all medical arrangements.—Mr. CHURCHILL said in reply: Whenever matters affecting medical organisation or administration are under consideration the Director-General of the Army Medical Service is called upon to give the Army Council the benefit of his advice. I do not think, therefore, that there is any advantage to be gained by making him a Member of Council.

Lieutenant-Colonel FREMANTLE: Is it not realised that the Director-General has to deal with a very large number of medical problems that arise in connexion with strategic questions on which he alone can give an opinion?—Mr. CHURCHILL: That point has been very carefully considered. We have the benefit of the advice of the Director-General of the Medical Services at any time, and of a great many other very highly skilled technical officers, but that is not a reason for adding these officers to the Army Council.—Lieutenant-Colonel FREMANTLE: How does the right honourable gentleman propose to get over the difficulties of hospital arrangement in a campaign coming under the head of three departments with three different members of the Army Council? There must surely be divided counsel.—Mr. CHURCHILL: I do not think there is any great difficulty in practice arising from that.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Final Examination, held from July 6th to 27th, the following candidates were approved in the undermentioned subjects:—

Medicine.—Doris Elizabeth Alcock, Royal Free; O. A. Baker, Univ. Coll.; Marjorie Muriel Sibley Bartlett, Royal Free and St. George's; Ivy Constance Beach, St. Mary's; A. H. Bean and A. Bearblock, Univ. Coll.; C. H. Bracewell, St. Bart.'s; Hylda Catherine Briscoe, Royal Free and St. Mary's; C. G. Bryan, London; A. Y. Cantin, London and Paris; G. H. A. P. Clavier, London; Beatrice Lakeman Collins, King's Coll. and St. George's; Elsie Eleanor Cowperthwaite, Royal Free and St. Mary's; F. P. de Caux, St. Bart.'s; A. H. G. Down, Univ. Coll.; T. A. Eccles, St. Bart.'s; R. W. Fairfax, Charing Cross; M. R. Flynn, Sydney; O. P. Gallegos, Charing Cross; R. M. Galloway, Edinburgh; W. R. W. Haight, Toronto Univ.; C. K. J. Hamilton, St. Thomas's and Oxford; H. W. Hammond, St. Bart.'s; I. Harris, Liverpool; Joan Margaret Redford Harris and Eleanor Harse, Royal Free; F. Hiam, Middlesex; J. T. S. Hoey, Oxford and St. Thomas's; S. H. G. Humfrey, Cambridge and St. Thomas's; M. F. Ismail, Guy's; R. O. Jones, Liverpool; A. E. Kassem, Guy's; Margaret Hypatia Kingsford, Royal Free; F. C. Lewis, Liverpool; E. T. Lloyd, Guy's; Kathleen Maria Boyce McArthur, St. Mary's; R. A. McCabe, Middlesex; Elisabeth Esther McCulloch, Liverpool; H. A. C. Main, St. Mary's; E. J. Newton, Royal Free; T. D. Overend, Univ. Coll.; Alice Owen, Dorothy Pantin, and Winifred Peacey, Royal Free; Arulmani Pichaimuthu, Charing Cross; Winifred Catherine Piggott and Norah Katharine Priestley, Royal Free; J. S. Robinson, Manchester; W. G. Rose, St. Mary's; Frederick M. Rossiter, Pennsylvania and Univ. Coll.; A. R. Roushdy, Charing Cross; Maud Sanderson, St. Mary's; Constance Snowdon, Manchester; G. W. Theobald, Cambridge and St. Bart.'s; H. E. Thomas, Univ. Coll.; N. G. Thomson, St. Bart.'s; C. J. A. Tjon-A-Man, Middlesex; Mary Isabel Turner, Manchester; Madeline Hilda Jane Umpleby, St. George's; Constance Muriel Willis, St. Mary's; E. F. Wilson, Guy's; and Beryl Wiseham, London.

Midwifery.—R. B. Agaskar, Middlesex; C. H. Andrewes, St. Bart.'s; L. H. Appleby, Queen's Univ.; T. J. D. Atteridge, St. Bart.'s; E. T. Bailey, Middlesex; W. E. Barnes, Univ. Coll.; S. H. Barnett, Cambridge and St. Thomas's; H. E. Beasley, Univ. Coll.; E. F. H. Bell, Durham; M. Bharatan, Madras and King's Coll.; H. J. Bhatia, Bombay; W. Breakell, Cambridge and Univ. Coll.; C. G. Bryan, London; F. C. W. Capps, St. Bart.'s; D. S. Chamberlain, King's Coll.; S. B. Chambers, Charing Cross; Dorothy Alice Denman Cropper, Cambridge and Edinburgh; P. T. Davidson, Middlesex; H. K. Denham, St. Bart.'s; A. G. Duncan, London; E. W. Evans, Birmingham; E. C. Faraker, Guy's; A. J. Fenn, King's Coll.; J. Franks, London; H. Freeman, Westminster; E. Gallop, St. Bart.'s; R. M. Galloway, Edinburgh; M. Garden and Janet Katherine Gatty, Univ. Coll.; J. B. Gregor, Guy's; B. J. Hallowes, St. Bart.'s; C. B. Hawthorne, Cambridge and Birmingham; W. E. Hayes, Oxford and St. Bart.'s; S. Hazeldine, Univ. Coll.; J. W. Hirst, Cambridge and King's Coll.; J. W. Hulme, Middlesex; B. L. Jeaffreson, St. Bart.'s; W. D. Jenkins, Middlesex; L. M. Jennings, St. Bart.'s; T. T. Jones, Manchester; E. J. L. Jones-Evans, St. Thomas's; H. C. V. Joy and M. Korn, London; F. G. Latham, Liverpool; H. D. Lawson, London; Bessie Levin, Univ. Coll.; E. O. Lewis, Cambridge and Univ. Coll.; I. Lewis, Univ. Coll.; D. McClean, St. Thomas's; Elizabeth Kathleen Mackay, Oxford and Charing Cross; C. C. Mackinnon, Middlesex; O. T. Maclaren, Guy's; Elizabeth Matthai, Royal Free; G. G. Michell, Univ. Coll.; W. P. Newman, St. Thomas's; E. J. Newton, Royal Free; S. Orchard, Cambridge and St. Bart.'s; Winifred Peacey, Royal Free; T. L. Pires, Charing Cross; J. J. Redelinghuys, Univ. Coll.; B. T. Richards, Birmingham; P. L. Richardson, Guy's; J. S. Robinson, Manchester; Mary Frances Roope, Charing Cross; I. Rosenberg, Guy's; F. M. Rossiter, Pennsylvania and Univ. Coll.; Maud Sanderson, St. Mary's; E. T. Saravanamuttu, Madras and Edinburgh; C. I. Schiff, London; Florence Gertrude Sherry, Manchester; M. Sidky, Guy's; G. S. Sinnatamby, Ceylon; Elfrida Elizabeth Ada Spencer, Charing Cross; H. Spibey, Cambridge and Univ. Coll.; P. Steinberg, London; R. N. L. Symes, St. Thomas's; H. B. Taylor, St. Mary's; E. W. C. Thomas, St. Bart.'s; D. R. Thompson and J. P. Traylen, London; Mary Isabel Turner, Manchester; J. C. Twomey, Liverpool; V. A. van Geyzel, Middlesex; Mary Gwendolen Vaughan, King's Coll.; J. G. Walker, Charing Cross; R. A. Walker, St. Thomas's; W. J. G. Walker, Univ. Coll.; L. K. Watson, Guy's; R. Weaver, Belfast; Agnes Edie Westwood, St. Mary's; Valentine Wilkinson, Cambridge and Univ. Coll.; W. H. Williams, Charing Cross; Constance Muriel Willis, St. Mary's; and W. C. S. Wood, King's Coll.

Surgery.—F. F. Abdullah, St. Mary's; G. W. Almeyda, London; Joan Katharine Somerville Cave, Royal Free; R. D. Cowan, Univ. Coll.; E. J. Crisp, Guy's; I. G. de Zilva, Madras; F. H. Edwards, Liverpool; Madeline Giles, St. Mary's; W. Göthe,

Middlesex; G. E. Hayward, Manchester; H. J. H. Hendley, Cambridge and St. Bart.'s; R. O. Jones, Liverpool; M. H. K. Kane and I. Lewis, Univ. Coll.; A. Maude, Manchester; E. O. Morrison, Cambridge and St. Mary's; S. Orchard, Cambridge and St. Bart.'s; Dorothy Pantin, Royal Free; A. S. Pearson, Birmingham; Winifred Catherine Piggott, Royal Free; A. D. Porter, King's Coll.; J. L. Potts, Cambridge and St. Bart.'s; A. M. Ramzy, Cairo and Charing Cross; W. Remington, Guy's; W. G. Rose, St. Mary's; G. R. A. de M. Rudolf, King's Coll.; R. G. V. Shaw, Sydney; F. V. Squires, Cambridge and St. Thomas's; J. A. Stephens, Leeds; A. H. Talaat, Middlesex; K. H. Tallerman, Cambridge and St. Thomas's; B. W. Thompson, Cambridge and St. Bart.'s; F. I. G. Tweedie and A. R. Walker, Cambridge and St. Thomas's; K. T. K. Wallington, Univ. Coll.; and H. N. Witham, St. Thomas's.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—At the last meeting of the Comitia, in addition to the business reported last week, the following recommendations were received from the Committee of Management:—

(1) That the University of Groningen be added to the list of universities recognised by the Examining Board in England.

(2) That candidates who have completed the courses of instruction and passed the examination in anatomy and physiology for the science degree of the University of Cape Town, be exempted from passing the second examination of the Examining Board in England.

(3) That the courses of instruction in anatomy and physiology at the South African School of Mines and Technology, Johannesburg, a College affiliated to the University of Cape Town, be accepted as fulfilling the requirements of the Regulations of the Examining Board in England in regard to the study of these subjects.

(4) That the requirement that a candidate should have attained the age of 23 years and 24 years before entrance to Examination in Parts I. and II. respectively, for the diploma in public health, be omitted from the Regulations for that diploma.

The Committee recommend that the following schools be added to the list of institutions recognised by the Board for Instruction in Chemistry and Physics—namely, County Borough of Blackpool Secondary School, Caterham School, Bishop's Stortford College, and the Victoria Institute, Worcester; and that the Coventry and Warwickshire Hospital be added to the list of recognised hospitals. The Committee recommend that the following be added to the list of institutions whose graduates in medicine are admissible to the final examination of the Examining Board in England under the conditions of Paragraph IV., Sections III. and IV. of the Regulations—viz: The State University of Ohio, the University of North Dakota, the University of Kansas City, the University of Hong Kong, the University of Virginia.

Sir Charles Ballance, on the recommendation of the Committee, was appointed visitor to the examinations of the Egyptian School of Medicine for the next period of examination.

THE National Association for the Prevention of Consumption and Other Forms of Tuberculosis is holding its eighth annual conference in St. George's Hall, Liverpool, from Thursday to Saturday, Oct. 7th–9th. Special attention will be devoted to preventive measures.

UNIVERSITY OF LONDON: THE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—The University of London has instituted recently a diploma in Psychological Medicine, the regulations for the obtaining of which have now been published. The examination is held twice in each year and is divided into two parts, Part A being held in March and October and Part B in April and November, and only for candidates who have passed Part A. Part A deals with the anatomy, histology, and physiology of the nervous system, one paper being also set in psychology. For Part B the candidates are examined in neurology and psychological medicine, the papers containing alternative sections enabling the candidate to specialise. Before being admitted to Part B the candidate must hold for six months a resident appointment at an institution for mental diseases, or attend for a year the practice therein, or pursue similar studies, with the approval of the University, in some other direction. Further information as to fees and syllabus will be given, on application, by the University Extension Registrar, Mr. John Lea, M.A., University of London, South Kensington.

LITERARY INTELLIGENCE.—Messrs. J. and A. Churchill announce for publication the following new books and new editions:—"The Anatomy of the Human Skeleton," second edition, by J. E. S. Frazer, F.R.C.S.; "Massage, its Principles and Practice," second edition, by J. B. Mennell, M.D.; "A Manual on Dental Metallurgy," fourth edition, by E. A. Smith; "A Handbook of Physics and Chemistry," fifth edition, by H. E. Corbin and A. M. Stewart; "A Textbook of Materia Medica," third edition, by Professor H. G. Greenish; "Catalysis and its Industrial Application," second edition, by E. Jobling, A.R.C.Sc.; and "A Synopsis of Hygiene," especially intended for those studying for a diploma in public health, by W. W. Jameson, M.D., and F. T. Marchant, M.R. San. Inst.—Messrs. Williams and Wilkins Company, London and Baltimore, announce the forthcoming appearance of "The Determination of Hydrogen Ions" by W. Mansfield Clark, Ph.D., containing numerous illustrations, an indicator chart in colours, and a bibliography of 1100 references. The price in England will be $5.50.

FEES FOR EXAMINATION FOR LIFE INSURANCE.—There has been discontent for a considerable time in the medical profession of Ireland over the inadequacy of the guinea fee as remuneration for an examination for life insurance. Some months ago several medical examiners declined to report for one guinea and demanded a fee of two guineas. In most cases the increased fee was readily paid. The Council of the Irish Medical Association then took the matter up and decided on a standard fee of two guineas, with the concession that in the case of small insurances (for policies of less than £500) one guinea would be accepted. More recently the medical examiners resident in Dublin held a meeting under the presidency of the President of the Royal College of Physicians, and decided to adopt the standard laid down by the Council of the Irish Medical Association. Notice has been given to the various insurance offices in Dublin of the decision of the meeting, and it is expected that the larger fee will be readily paid.

LONDON SCHOOL OF MEDICINE FOR WOMEN.—A post-graduate course of instruction in the treatment of venereal diseases will be held during the fortnight beginning Monday, Sept. 13th, for qualified medical women. The course is in connexion with the London (Royal Free Hospital) School of Medicine for Women and the Royal Free Hospital, the Elizabeth Garrett Anderson and the London Lock Hospitals. Application for admission to the course should be made to the Secretary, Medical School, 8, Hunter-street, London, W.C.1., from whom particulars can be obtained.

The following scholarships have been awarded from October next:—

St. Dunstan's Medical Exhibition: Miss E. Masterman (Hamilton House School, Tunbridge Wells).
Isabel Thorne Scholarship: Miss E. Adams Clarke (Sydenham High School).
Mabel Sharman Crawford Scholarship: Miss F. I. Moore.
Sir Owen Roberts Memorial Scholarship: Miss M. Bowstead.
Lewis Memorial Scholarship: Miss E. H. R. Newboult.

Appointments.

EVANS, D. E., M.B. Lond., has been appointed an additional Medical Referee under the Workmen's Compensation Act, 1906, for County Court Circuit No. 31, attached more particularly to the Neath and Aberavon County Courts.

GOODWIN, A., O.B.E., M.D., B.S. Lond., F.R.C.S. Edin., Obstetric Tutor to the Westminster Hospital.

LEWIS, E. C., M.B., M.S., F.R.C.S., Assistant Surgeon to the Royal Free Hospital.

SALISBURY-SHARPE, W., M.D., F.R.C.S.I., Assistant Surgeon to the Central London Throat and Ear Hospital.

SINCLAIR, N. F., F.R.C.S. Eng. & Edin., Assistant Surgeon to the West London Hospital.

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £250.
Battersea General Hospital (Incorporated), Battersea Park, S.W.—Third Res. M.O. £200.
Belfast County Borough.—Bacteriologist and Pathologist. £700.
Bellahouston Hospital, Glasgow, Ministry of Pensions.—Med. Electrician. £650. Pathologist. £300. Two Anæsth.'s. £350 or £450. Three P.'s or S.'s. £450
Bengal, University of Dacca.—Chair of Physical Education. Rs. 9000 to Rs. 12,000.
Berks and Bucks Joint Sanatorium, Peppard Common, Oxon.—Asst. Res. M.O. £350.
Birmingham Children's Hospital.—Jun. Vis. Anæsth. £50. Res. M.O. £150.
Birmingham City Hospital for Infectious Diseases.—Asst. Res. M.O. £350.
Birmingham General Hospital.—Res. M.O. £155. Res. Anæsth. £100. H.S. £125.
Birmingham University.—Lect. in Physiology. £250. Demonstrator in Pathology. £350.
Blackburn and East Lancashire Royal Infirmary.—Jun. H.S. £250.
Bristol Eye Hospital.—H.S. £150.
Canterbury, Chartham Mental Hospital.—Asst. M.O. £350.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Coventry Education Committee.—Two Sch. Dentists. £500.
Derby Borough Mental Hospital.—Asst. M.O. £350.
Dorset County Council.—Asst. County M.O.'s. £500.
Dreadnought Hospital, Greenwich.—H.S. and H.P. £100.
Dumfries, Crichton Royal.—Asst. P. £350.
East Ham Education Committee.—Sch. Aurist.
Essex Education Committee.—Sch. Med. Inspec. £500.

Glasgow, Victoria Infirmary.—Jun. Asst. P. £100. Med. Tutor. £300.
Great Yarmouth General Hospital.—H.S. £250.
Hampstead General and North-West London Hospital, N.W.—Clin. Asst., Ear, Nose, and Throat.
Hertford County Hospital.—H.S. £200.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P.
Huddersfield Royal Infirmary.—Asst. H.S. £150.
Ingham Infirmary and South Shields and Westoe Dispensary.—Jun. H.S. £175.
Isle of Wight, Royal National Hospital for Consumption, Ventnor.—Locum Asst. Res. M.O. 6 guineas per week.
Lancashire County Council, Rufford Sanatorium and Training Centre.—Med. Supt. £800.
Leasowe Hospital for Children, Cheshire.—Jun. Res. M.O. £200.
Leeds University, School of Medicine.—Lect. in Exper. Phys. £500.
Lincoln County Hospital.—Jun. H.S. £150.
Liverpool, David Lewis Northern Hospital.—Two H.P.'s and Three H.S.'s. £120.
Liverpool, Royal Southern Hospital.—Two H.P.'s and Three H.S.'s. £100.
Liverpool School of Tropical Medicine.—Three Medical Men for Clinical and Research Work in Tropical Medicine.
London County Council Mental Hospital Service.—Asst. M.O.'s.
London Lock Hospital, Soho, W.—H.S. £200.
London Temperance Hospital, Hampstead-road, N.W.—Cas. O. £200. Radiographer. £105. H.P. £120.
London University.—William Julius Mickle Fellowship. £200.
M.A.B. Tuberculosis Service.—Asst. M.O.'s at Margate, £515; at Brentwood, £579.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Manchester, Ancoats Hospital.—H.S. £150.
Manchester, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £300.
Manchester Children's Hospital, Pendlebury, near Manchester.—Two Res. M.O.'s. £150.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Margate, Royal Sea Bathing Hospital.—Res. S. £200.
Metropolitan Borough of Wandsworth.—Asst. Tuberc. O. £818.
Middlesbrough, North Ormesby Hospital.—Asst. H.S. £175.
Natal, Corporation of Durban.—M.O. for Mat. and Child Welf. £700.
Neath (Glamorganshire), Beckett's Park (near Leeds), and Ashurst (Oxford), Ministry of Pensions Hospitals.—Pathologists. £600.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Temp. Hon. S. Also Refractionist. £200.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Sen. and Jun. Demonstrators of Anatomy. £450 and £350 respectively.
Orkney, Parish of Rousay and Egilshay.—Res. M.O. £300.
Portsmouth Education Committee.—Asst. School M.O. £500.
Queen Mary's Hospital, Stratford, E.—H.P.
Salford Union Infirmary.—Res. Asst. M.O. £350.
Scarborough Education Committee.—Sch. Dent. S. £250.
Sheffield Royal Infirmary.—H.P. £150.
Staffordshire Education Committee.—Twelve Med. Practs. £600.
Stafford, Staffordshire General Infirmary.—H.S. £250.
Stockport General Infirmary.—Jun. Res. S. £200.
Surrey County Council.—Tuberc. M.O. £770.
Taunton and Somerset Hospital.—Sen. and Jun. H.S.'s. £200 and £150.
Tottenham Education Committee.—Asst. Sch. M.O. £650.
Windsor, King Edward VII. Hospital.—H.S. £200.
Wolverhampton and Staffordshire General Hospital.—H.S. £200.
Woodilee Mental Hospital, Lenzie, near Glasgow.—Asst. M.O. £350.

The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Nottingham, N.

Births, Marriages, and Deaths.

BIRTHS.

BOYLE.—On August 9th, the wife of Dr. Boyle, Disley, Cheshire, of a daughter.

MCCREA.—On July 31st, the wife of H. Moreland McCrea, M.D., Devonshire-place, W., of a daughter.

MARTYN.—On July 30th, at Zeitone, Cairo, the wife of Captain A. F. C. Martyn, R.A.M.C., of a son.

WATSON.—On August 9th, to Dr. and Mrs. G. W. Watson, of Park-square, Leeds—a son.

MARRIAGES.

JEX-BLAKE—HERBERT.—On Thursday, August 5th, in the Parish Church at Wilton, by the Bishop of Salisbury, assisted by the Rev. Guy Campbell, Arthur John Jex-Blake, M.D. Oxon., F.R.C.P., of 13, Ennismore Gardens, London, to Muriel Katharine Herbert, younger daughter of the late Earl of Pembroke, of Wilton House, Salisbury.

REVELL—ANDREW.—On August 4th, at Lawhitton, Launceston, Rowan William Revell, M.B., B.S. Lond., D.P.H., to Edith Mary Andrew, daughter of the late M. Andrew.

SUTHERLAND—FITZPATRICK.—On August 4th, at St. Joseph's Retreat, Highgate-hill, N., Halliday Gibson Sutherland, M.D., to Muriel Fitzpatrick, daughter of the late John Frederick Fitzpatrick and Mrs. Fitzpatrick, of Cromwell-avenue, Highgate-hill, N.

WATTS—DUNHAM.—On August 7th, at St. Stephen's Tonbridge, Harry John Manning Watts, M.R.C.S., L.R.C.P., to Winifred Mary, second daughter of Henry Symes Dunham, of Bankside, Tonbridge.

DEATHS.

EWART.—On August 1st, very suddenly, at his residence, Eastbourne, John Henry Ewart, M.R.C.S., L.R.C.P., aged 73 years.

RHODES.—On August 5th, at Brechin-place, S.W., J. Herbert Rhodes, M.B., M.R.C.P., aged 45 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

A SKETCH OF SEVENTY YEARS.[1]

BY T. PRIDGIN TEALE, M.A. OXON., F.R.S.

THINKING over my subject, I am almost "snowed under" by the number of questions that arise before me deserving serious notice. I can therefore only select those which, on looking back upon this momentous period, seem to demand attention mainly as enforcing principles, passing by with severe abstention many events and important points which tempt to digression.

Let me begin by being egotistical, and by referring to the earlier years of the Leeds School of Medicine. My medical education began in the summer of 1849, when on leaving school (Winchester) I became a pupil of the surgical practice of the Leeds Infirmary. Of this I was a regular attendant during the vacations of the three years I passed as an Oxford undergraduate at Brasenose. During these vacations I accompanied my father in his ward visits on all operations by him and his colleagues ("Sam" Smith and William Hey) and in all emergency night calls, which were numerous owing to the frequent accidents in the construction of the Arthington Tunnel. On leaving Oxford in the summer of 1852 I became a pupil of the Medical Department of King's College, London, where Fergusson and Bowman were on the surgical staff; Todd, Budd, and George Johnson were on the medical staff; Partridge and Beale were on the lecturing staff.

What was my position on commencing lectures on anatomy and physiology and on work in the dissecting-room? I entered upon these studies, having witnessed, in the companionship of my father, nearly every surgical operation then in use, and I had attended and noted every post-mortem for which my vacations at Leeds afforded the opportunity. Think what this meant in giving reality and intense human interest to a beginner in the medical curriculum. I make a point of this in order to emphasise what I feel about the training of a doctor.

The Evolution of the Leeds School of Medicine.

With these preliminary remarks let me tell of the evolution of the Leeds School of Medicine, making use of a passage from the address I gave to this society in 1903. The Leeds School of Medicine practically began its career as a complete school in October, 1831, in rooms in the old dispensary at the top of Templar-street, and my father gave the opening lecture. At the end of three years the Council purchased a "very commodious building"—in fact, a good double dwelling-house—at the corner of East Parade, hard by the infirmary. In this house a front and back sitting-room were thrown into one to make a museum, and a first-floor room was converted into a theatre for about 25 students. A small narrow dressing-room was made into a place for injecting "subjects" which were brought up from below through a trap door. Skylights were put into the attics to convert them into a dissecting-room.

On the benches during the opening years there sat as students Sir Spencer Wells, Dr. Chadwick, senr., Mr. Samuel Hey, and Sir William Priestley. Inadequate as such a building would seem to us now, it was at the time not inferior to the buildings of the other provincial schools, and, aided by the teaching at the infirmary, it raised the Leeds School to a reputation not the least among the medical schools of England.

The next stage occurred in this way. As soon as a site in Great George-street was selected for the new infirmary some of the staff felt that the school must follow the infirmary, and not be left at the distance of one-third of a mile. A committee, consisting of Dr. Heaton, Mr. Wheelhouse, and myself, was appointed and the site in Park-street was purchased. Having bought the site we set to work to plan for ourselves so as to make the best possible use of the ground. We then selected an architect and put our provisional plans into his hands; he, of course, absorbed our ideas and improved upon them.

Such was the new school in Park-street—now the abode of the Thoresby Society—and it was, I believe, at that time the only school in the provinces built for the special purpose, and was far in advance of the provincial schools then in existence. This was in 1864, the year of the laying of the foundation stone of the new infirmary. The opening address was given on October 2nd, 1865, by Sir James Paget, and the following passage may well be quoted therefrom.

[1] An address to the University of Leeds Medical Society, Dec. 5th, 1919.

"This only I will say, that from the beginning to the end of your career, and day by day, you must study diseases and their treatment in actual practice. There is nothing of which the observation of the careers of students has made me more sure than of this. If I except the few—the unhappily too few—who, after taking high degrees in the universities, have studied medicine, I should say that as a constant rule the best students, and they who have proved themselves the best not only in the schools but in after life, have been those who, in the beginning of their studies and for the most part before attending lectures, have been pupils in provincial hospitals, or with active and intelligent general practitioners, who have enabled them to see practice every day and helped them to study it.

"I am aware that this opinion—that the study of actual practice should extend through the whole period of medical education—is not held by some who have carefully thought upon the subject. They would not have this practical study, as I would—first, last, and in the midst of all. I have, therefore, again and again considered the point; but the fact always remains to me convincing, and not strange, that the best students are those who have from first to last, and always, combined the study of actual practice with that of the principles and foundations of our profession; or who, if they have begun with one of these, have begun with practice, and then studied the principles together with it."

As time went on the growth of the school and of the Yorkshire College led to the union of the two bodies in the University of Leeds. The work of the medical department was carried on for a time in the school in Park-street. It soon, however, became evident that even our "new school" was inadequate to meet the rapidly increasing demands of medical education, especially as it has to be carried on by a University College. The result, you all know, is the present School of Medicine.

Personnel of the School of Medicine.

Having dealt with the buildings we may turn to the personnel of those who had to use them as teachers or pupils. Looking back to the early days, the days preceding the removal of the school of 1834 to the new building in Park-street, 1832–65, and of the infirmary to its enlarged site in Great George-street, 1869, it must be borne in mind how the commencement of the School of Medicine was made by a certain number of medical men who had pupils or apprentices for whom they wished to provide teaching in the earlier subjects of study—anatomy, physiology, chemistry. The result of this was that they themselves, in the midst of active work, most of them busily engaged in family practice, including the surgeons to the infirmary, undertook the various lectureships, and so provided the teaching. It followed, therefore, as a result that all, or nearly all, the students were resident in Leeds, and most of them lived in the houses of medical practitioners. A further consequence was that it was possible for Mr. Sam Smith, surgeon to the infirmary, lecturer on midwifery, to deliver his course of lectures at 7 o'clock in the morning during the summer session.

The early work spread to the infirmary and enabled Mr. Wheelhouse and myself to pay our bi-weekly clinical visits to the wards at 8 o'clock in the morning, and allowed me to make that same hour the commencement of my operations at the infirmary and in private. As a further instance of the energy of the makers of the school at that period I may relate that in preparation for the meeting of the British Association in 1858 (not the B.M.A.), in order to put the museum into presentable order for the visits of scientific men, several of us—Nicholson Price, Scattergood, Wheelhouse, and myself—met twice a week from 7 to 9, revising the museum, looking over the specimens, and where necessary remounting the wet preparations. The 8 A.M. ward visits were continued by Mr. Wheelhouse and myself until our retirement as consulting surgeons in 1884.

A Quotation from an Address in 1903.

I will now quote from my address to you in 1903.

"There is one question on which I feel strongly and about which I venture to say a few words rather in the way of caution than of actual guidance. We have recently been told by a leading professor of physiology, whose opinion cannot but carry weight with us all, 'that surgery and medicine cannot be studied or understood without a previous knowledge of anatomy and physiology, and that some of his fellow-students early discovered that the time spent in the wards during these first years was wasted, and who soon discontinued the attendance until the subjects which were necessary for obtaining any benefit from it were finished with.' Perhaps they were right in the circumstances under which such attendance took place. Yet there is another side to this question, and I have always leaned to the other side, and have regretted the divorce of the early years of anatomy and physiology from any association with the human being and illness, for which all this scientific study is a preparation."

Here let me speak of the system I carried out in my ward teaching, which ended when in 1884 I became consulting surgeon at the end of my 20 years as full surgeon—35 years ago. It fell to me as junior on the surgical staff to enter names of students for attendance on the surgical practice of the infirmary. In accordance with my strong views, I encouraged the new men to commence attendance on the surgical practice of the hospital as soon as they entered for anatomy and physiology. The students attending the surgical side were divided into four classes, one class being assigned to each of the four surgeons for attendance on the ward visits of that surgeon for three months. At the end of this time they passed on to one of the others. In making out the lists I used to assign the first year's men to my list. On meeting this class, including the newcomers, at the opening of the session, I used to say to them: "Some people hold the view and will tell you that to go round the wards and see patients when you have not learned your anatomy and physiology is waste of time. My answer would be:—

'If you have used your time aright, listening intelligently to every question put by the surgeon to patient, to dresser, to nurse, or to house surgeon, just as if they were addressed to yourself, making a mental note of what passes; if you have used the splendid opportunity vouchsafed to you as a hospital pupil, and can at the end of this first three months judge by the look whether a patient is "better or worse," you will have made a good start in clinical study, and will have acquired a habit which will stand you in good stead in your future career.'"

Anæsthetics.

Now a word about anæsthetics. We will begin with *laughing-gas—nitrous oxide*. This was at first used as a chemical—and comical—toy. Mr. Wheelhouse used to tell of its amusing effects when he and his fellow-students at the Medical School tried it upon themselves and each other.

Next came *ether* from the United States, introduced by a dentist named Morton. I remember, somewhere in the very early "fifties," going with my father to see the administration of ether, by means of a cumbrous machine at the infirmary, as an anæsthetic for an operation. I have no recollection either of the apparatus used or of any operation.

About this time *chloroform* was discovered as an anæsthetic by Sir James Simpson and rapidly made its way to general use, though accepted with much apprehension. As time went on and the use of chloroform became general the frequency of deaths, and especially when it was used for slight operations—extraction of teeth, reduction of dislocations, and examinations otherwise painful—was creating serious alarm.

Then came an *Epoch in Anæsthetics*. At the International Ophthalmic Congress in London in July, 1876, Dr. Joy Jeffries, of Philadelphia, made a most urgent appeal to British surgeons to substitute for chloroform ether, which American surgeons and dentists had found to be almost free from danger—at any rate much less dangerous than chloroform. He gave ether on the open towel in large quantities. Here in Leeds we at once promptly responded. We began in the American way—first with the towel, then with the grid (brought to us from America by the infirmary chaplain, now Canon Spencer Gough, of Barningham)—struggling with difficulties, as a duty imposed upon us until at last relief came from Ormsby and Clover in their invaluable "inhalers," and ether asserted its superiority, a superiority which is now being recognised all over. I have written and preached and taught the greater safety of ether, and I have lived to see it paramount as the reigning anæsthetic.

Let me now speak of

Instruments of Precision and their Introduction into Practice.

Here I would give precedence to those used for *anæsthetics*. They are one of the earliest, the most universally employed, and the most effective aids to surgery, and in fact to medicine, which includes surgery, of any instrument ever devised.

When I became a student at King's College in October, 1852, Dr. Snow was working out the science of chloroform administration, and he had invented, I believe, the first mechanism for its administration, "Snow's Inhaler." At that time the only instrument of precision in general use, even then struggling to assert itself, was the *stethoscope*. Next came the *ophthalmoscope*. In my third summer session, May, 1855, at the height of the Crimean war, I became clinical assistant to Sir William Bowman at Moorfields, *vice* Hulke, who had gone out with the team of the picked young surgeons of London to work in the military hospitals of the Crimea. At that time the ophthalmoscope was being introduced to the staff and pupils at Moorfields by Dr. Bader, a refugee—Polish, I think. The invention of the instrument was by a German, and the Germans were ahead of England in its use and had already published an illustrated work by Jaeger, of Vienna.

But the ophthalmoscope was destined to have a wider field. It occurred to a young physician of Leeds, Clifford Allbutt, that it must come into use by the physician. He took every opportunity of mastering its use, including the field offered by the West Riding Asylum, thanks to the collaboration of Crichton Browne. Allbutt finally brought the matter before the profession by publishing a work "On the Ophthalmoscope in Medicine." (Macmillan, 1871.)

Clinical thermometry.—After a while the clinical thermometer comes on the scene—two long thermometers in a "*sesquipedalian*" box, about 12 inches long, which the poor doctor had to carry about under his arm. Clifford Allbutt again came to the rescue. Realising the enormous

possibilities of the instrument, and the necessity of easy portability, he devised, with the aid of Mr. Reynolds, of Harvey and Reynolds of Leeds, the short thermometer that could be carried in the waistcoat pocket, and he got a scientific friend to invent an index that would register the temperature. Allbutt also contributed to spread the use of the instrument by using freely as a handbook and for quotation "Clinical Thermometry," by Wunderlich.

Hypermetropia and astigmatism.—Then followed closely the discovery, aided by the ophthalmoscope, of optical defects that could be corrected by carefully selected lenses, hypermetropia, and astigmatism, worked out by Donders, of Utrecht, the great Dutch scientist, whose work on optical corrections was published in translation by the Sydenham Society and so brought before English-speaking ophthalmologists.

Laryngoscope.—Whilst the ophthalmoscope and thermometer were "making good" in England there arose another instrument of investigation, the laryngoscope. This came before the profession in another volume of the Sydenham Society—a translation of Czermach's work. Our early work was difficult, as we had no electric light, no local anæsthetics, no specially designed instruments. Of early successes two were very encouraging: one a sixpence lying flat in the larynx; the other a flat piece of bone lying vertically. The removal of these was at that time a veritable triumph.

Endoscope.—Following the laryngoscope came the endoscope, invented by M. Dieulafoy and introduced into Britain by Dr. Cruise, of Dublin. Dr. Cruise had improved the lamp, but its use was cumbrous and difficult. I had one conspicuous success. A patient who was being treated for stricture consulted Dr. Allbutt. He suspected stone, and sent him on to me. Having sounded and felt a calculus, I examined with the endoscope and saw several calculi. Ten were removed with a vesical pump. The man was cured. This endoscope did not make much progress. The invention in due time of an electric illuminator made all the difference, and now it is a recognised part of the conditions of surgery.

Hypodermic syringe.—I now come to the last of my special selection of instruments of precision, the hypodermic syringe, in reference to which this portion of my paper shall conclude with a quotation from the introductory address in 1867. I had then been for three years surgeon to the infirmary, working with my colleagues in the old infirmary under what would nowadays be looked upon as insuperable disadvantages.

"The increasing confidence in the physical modes of exploring the human body renders us less satisfied to remain in doubt when we can obtain certainty. We are approaching the time when we shall shrink from treating loss of voice without using the laryngoscope, or disease of the brain without exploring the optic nerve with the ophthalmoscope, or disease of the bladder without the aid of the sound or the endoscope. Thus prepared to demand exactness in observation, there has been granted to us one of those discoveries which, like chloroform, mark an era in our history—*hypodermic injection.* Valuable though this mode of treatment may be in its command over pain, it is still more important to the advance of science in the field of inquiry it has opened out, not only for testing the value of medicines, but also for searching into the nature of morbid processes themselves. When we see a neuralgia of long standing cured by one injection of morphia; when we see the same remedy *visibly* restoring to health congested vessels of the conjunctiva; reducing unnatural heat, not of the whole body, but of a suffering portion of it; lessening the swelling of an inflamed joint; arresting vomiting depending upon a lacerated brain, or upon peritonitis or suppressed menstruation—'I speak of the things that I do know'—we must feel that we have much to revise and much to learn as to the intimate nature of morbid processes by the light of our new power."

This was said 53 years ago.

Leeds University Address, 1888.

My next Introductory Address was given at the Leeds University 21 years later, in 1888. I had then been for four years consulting surgeon, with the right to use six beds for cases of my selection. The address was delivered at two weeks' notice to fill the gap made when Lord Lister was suddenly unable to fulfil his undertaking, and so it was given under disadvantages. Speaking of the elaborate arrangements for turning out an efficient practitioner I urged that—

"There was a part, and that no small one, in the training of a skilful practitioner which neither curriculum, nor lectures, nor examinations could secure. That part might be called self-education—the earnest seeking after every opportunity of seeing, of observing, and of doing; the training of their eye not only to see disease, but to observe its effect upon the countenance, the manner, the character of the patient, and, beyond the patient himself, the effect upon others—parents, children, friends, dependants—so that their minds might grasp the whole situation, and enable them to discharge in the fullest sense their duties as a medical adviser; the determination to use every opportunity of watching illness, of discharging small duties about the sick, of training the hands and touch and mind to handle gently, and, when obliged to give pain, to give as little pain as possible. And not least of the faculties of immense importance to a medical man was tact. That was partly the result of natural qualities, partly the result of training of the observation. Tact implied the power of observing and estimating the effect of their own manner and words upon others, combined with judgment to perceive what was the best thing to do, with the right feeling to enable them to act unselfishly in the interest of another."

King's College Address, 1908.

The third address, 20 years later, was delivered at King's College, London, where 54 years before I had entered as medical student, and had listened to the opening address. This address was essentially a "retrospect," a record of what existed when I was a student. But in referring to the advance of surgery I quoted from the records of operations at the Leeds Infirmary, with which, of course, I was familiar. From this summary I take two or three examples of steadily diminishing fatality.

The comparisons are taken in half decades, beginning in 1861 and ending 1905.

Ovariotomy.—In the 20 years 1860–80, out of 86 cases 1 in 3 proved fatal; in the 5 years 1901–05, out of 105 cases 1 in 21 proved fatal.

Radical cure of hernia.—In the 5 years 1880–85 the fatality was 1 in 11; in the 5 years 1885–90, out of 790 cases the fatality was 1 in 197.

The "Family Doctor."

In conclusion, let me say a few words as to the "family doctor." I will not call him a general practitioner, a term which implies the technical side of our profession. A family doctor who is all this—a competent practitioner of medicine—but, in addition, may be all that is implied in the words of a colleague at a recent medical dinner: "The practice of medicine is a personal, individual, intimate thing." Knowledge of this can only be acquired by contact with human beings in sickness and health, in poverty and well-being. Such a man should enter a house as a longed-for friend and a kindly and sympathetic adviser. Many such have I known and treasured as personal friends—and not least—among the noble corps of country doctors.

COLONIAL HEALTH REPORTS.

Bahamas.—Mr. F. C. Wells Durrant, acting Colonial Secretary, in his report for 1918–19, estimates the population at 60,082. The birth-rate was 34·3 and the death-rate 15·8 per 1000. Notwithstanding an epidemic of chicken-pox, from which very few fatalities resulted, the public health of the colony was, on the whole, good. There were a few cases of typhoid fever. Owing to a vigorous and stringent quarantine against incoming vessels, the colony was fortunately spared the ravages of Spanish influenza. Dr. A. H. B. Pearce assumed the duties of chief medical officer in March, 1919, in succession to Dr. J. Baird Albury, who had been acting on half salary for a considerable time. There were 765 admissions to the General Hospital (which comprises, besides the hospital proper, the Victoria Jubilee Infirmary, the lunatic asylum, and leper wards), making a total under treatment during the year of 900, of whom 315 were discharged recovered, whilst 250 were relieved and 131 died.

Gambia.—A report prepared by Mr. B. A. Finn, acting Assistant Colonial Secretary, reporting on the Blue-book for 1918, states that in 1911 the population of Bathurst was given as 7700 and that of the Protectorate as 138,401. It is probable that the population of Bathurst has increased but little since that date. On the other hand, there is good reason to believe that the population of the Protectorate is at least 30 per cent. greater. No accurate information is obtainable with regard to births and deaths in the Protectorate. The total number of Europeans resident was 122, of whom 112 were males and 10 females. There were 6 deaths amongst all these, from pneumonia and influenza, and no births. Amongst the native population of Bathurst the birth-rate was 34·1 and the death-rate 71·4 per 1000. There were over 300 deaths in Bathurst and 7800 in the Protectorate from the influenza epidemic which swept over the whole coast in the latter months of the year. Infantile mortality was at even a higher figure than usual. Out of a total of 263 births in Bathurst there were 50 stillbirths and 138 deaths of infants of less than 1 year of age; there were also 89 deaths of children over 1 and under 5 years of age. Malarial fever was the most prevalent disease, and pneumonia was more prevalent than usual, but there was no case of yellow fever, small-pox, or plague, and only 1 case of typhoid fever. The total rainfall for 1918 was 54·03 in., being greatly in excess of the average for the past ten years, which was 33·45 in. The highest recorded temperature was 101° F. (May 20th) and the lowest 48° (March 16th). The highest mean temperature in any month was 93° and the lowest 55·1°.

Gold Coast.—Captain C. E. Cookson, Assistant Colonial Secretary, is responsible for the report on the Blue-book for 1918, which gives the total population of the Gold Coast and its dependencies as 1,503,386. The number of Europeans resident in the colony during 1918 was 1823, comprising 515 officials, 681 employees of trading firms, 578 employees of

mining companies, and 49 missionaries. The death-rate amongst Europeans in the colony was 30·7 per 1000, as compared with 12·43 in 1917; the invaliding rates per 1000 for the same periods were 55·4 and 52·49 respectively. Of the 9 deaths which occurred amongst European officials in the colony and its dependencies 2 were due to blackwater fever and 4 to influenza. The death-rate of European officials fell from 15 per 1000 in 1917 to 11·6 per 1000 in 1918, and but for the deaths from influenza would have fallen to 3·8 per 1000. Of the 50 deaths of European non-officials 4 were due to blackwater fever, 25 to influenza, and 1 to yellow fever. No means exist whereby accurate statistics relating to the health of natives can be obtained. Treatment was given in 3181 cases of malaria, 416 of dysentery, 356 of pneumonia, and 239 of tuberculosis. In all 58,666 cases of disease were treated during the year, and of these 524 proved fatal. In September, 1918, an outbreak of influenza occurred on the coast line and spread rapidly through the colony and its dependencies. Only a very rough estimate can be made of the number of deaths caused by the pandemic, but it must have been very great. In the 7756 cases treated in the hospitals there were 204 deaths, giving a case mortality of 2·6 per cent. Assuming three-fourths of the population to have been attacked and the case mortality-rate the same the total number of deaths would be 30,000. The outbreak of smallpox that occurred in the Northern Territories in 1917 continued in 1918, when 88 cases were reported with 24 deaths. Ten cases of sleeping sickness were treated during the year. Of 17 cases of blackwater fever treated 4 proved fatal, and of 5 cases of yellow fever all resulted in death. The climate, though hot and damp, is cooler than that of most tropical countries situated in the same latitude. It is not in itself unhealthy, but an evil reputation has been earned for it in the past by the prevalence of mosquito-borne diseases, against which all possible precautions have constantly to be taken. The Gold Coast is peculiarly free from many of the discomforts associated with tropical countries; hot nights and intense heat by day are the exception rather than the rule, while insects are comparatively unobtrusive. The efforts of the sanitary and medical authorities in promoting hygiene and treatment of disease continue to exercise a beneficial effect on the general health of Europeans.

POISONOUS SHEEP-DIPS.

A NUMBER of deaths have occurred among sheep as a result of the use of poisonous dips during the present dipping season. There has always been a certain mortality with the use of arsenical dips, but the cheapness of arsenic as a drug, and the fact that it and its preparations have been used both internally and externally for skin complaints in animals for many years, perhaps account for the vogue it enjoys and the reluctance with which its use is relinquished. The advances in the science of therapeutics are but slowly recognised by the wholesale makers of proprietary remedies like sheep-dips, and really some legal measures and regulations want bringing forward to do away with the dangerous treatment and wholesale and indiscriminate drugging of animals and the subjecting of them to the action of remedies of out-of-date, crude, and mediæval form. In the case of sheep-dips lime and sulphur, cresol, lysol, and bacillol are all as effective as arsenical preparations, and much safer.

A GERMAN SURGICAL DIRECTORY.

WE have received from the publishing firm of Johann Ambrosius Barth in Leipzig an octavo volume of 288 pages, entitled "Deutscher Chirurgen-Kalender," being a directory of German surgeons and orthopædists, containing short biographical and bibliographical details. The directory has arisen, it is stated, from the need felt for a handy book of reference giving the present and past professional and literary activities of surgeons from which to draw correct conclusions and avoid confusion of names. Curiosity in regard to the career of this or that colleague after five years of war is intended to be satisfied. Names are included from German-speaking Austria and Switzerland, and from the Scandinavian countries. The omission of many well-known names is explained by the uncertain political conditions. The directory is an entirely new compilation, based upon the answers to a circular sent out. The editors are Professor August Borchard, one of the editors of the recent German War Surgery, and Dr. W. v. Brunn, privat-docent for the history of medicine in Rostock. The price is M.36.

LEFT-HANDEDNESS AND MIRRORED WRITING.

IN this reprint of a paper from *School Hygiene* Dr. James Kerr deals with a bypath which borders on medical fields. Dr. Kerr attempts to show that left-handedness presents two varieties, what he calls pure left handedness associated with right brain development and normal mentality, and the variety whose fingers are all thumbs, denoting want of cerebral specialisation in dextrality. He thinks that the supposed association of stammering with correction of left-handedness is unproved and is due to mis-read statistics, also that the idea of ambidextral culture developing fresh centres on the right side of the brain is physiologically unsound. The subjects of dextrality and mirrored work are very thoroughly discussed, especially from the standpoint of the school doctor. Dr. Kerr is a recognised authority on such questions and the paper is a valuable addition to the literature of the subject.

R. W. P.—Any opinion would be useless unless based on a careful local examination.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE.

MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.

A Course of Twelve Lectures on Neurology, open to Students and Graduates of the London Hospital and other Schools—

TUESDAY, August 17th.—2 P.M., Lecture XI.:—Dr. Riddoch: The General Treatment of Disorders of the Nervous System.

WEDNESDAY.—2 P.M., Lecture XII.:—Dr. Thompson: Treatment of Paraplegia.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, August 16th.—12.15 P.M., Dr. Burnford: Pathological Demonstration. 5 P.M., Mr. MacDonald: Hæmaturia.

TUESDAY.—10.30 A.M., Surgical Registrar: Demonstration of Cases. (Surgical Wards.) 2 P.M., Dr. Burnford: Demonstration of Medical Cases. (Medical Wards.)

WEDNESDAY.—11.30 A.M., Mr. MacDonald: Demonstration of Cystoscopy. 4.30 P.M., Dr. Owen: Demonstration of Medical Cases. (Lecture Room.)

THURSDAY.—10.30 A.M., Dr. Simson: Gynæcological Demonstration. 4.30 P.M., Mr. B. Harman: Purulent Conjunctivitis.

FRIDAY.—12.15 P.M., Dr. Burnford: Applied Pathology.

SATURDAY.—12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen.

Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.

MONDAY, August 16th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

CANCER HOSPITAL, Fulham-road, S.W.

Clinical Lectures on the Diagnosis and Treatment of Cancer.

TUESDAY, August 17th.—4.30 P.M., Sir Thomas Horder: The Value of Combined Methods of Treatment in Inoperable Cancer.

Communications, Letters, &c., to the Editor have been received from—

A.—Dr. A. C. Alport, Moniaive; Dr. B. P. Allinson, Lond.; Mr. R. J. Albery, Lond.

B.—Messrs. John Bale, Sons, and Danielsson, Lond.; Sir J. R. Bradford, Lond.; Dr. W. C. Bosanquet, Lond.; Mr. S. A. Best, Lond.; Dr. H. P. D. Benson, Finglas; Mr. J. Burns, Edinburgh; Col. R. J. Blackham, Bearsted; Mr. T. W. Boughton-Leigh, Arundel.

C.—Capt. C. Cooke, R.A.M.C.(T.); Dr. C. Coombs, Clifton; Dr. H. P. Cholmeley, Forest Row; Capt. W. V. Corbett, R.A.M.C.; Dr. G. D. H. Carpenter, Oxford; Mr. W. E. Cossons, Manchester; Chartered Society of Massage and Medical Gymnastics, Lond.; Dr. H. Curtis, Lond.; Messrs. J. and A. Churchill, Lond.; Mr. G. Chubb, Lond.

D.—Mr. H. Dickinson, Lond.; Dr. J. N. D'Esterre, Lond.; Mr. T. N. Deb, Cox's Bazar, Bengal.

G.—Dr. A. Goodwin, Lond.; Dr. T. W. Griffith, Leeds.

H.—Mr. P. B. Hoeber, New York; Dr. G. M. Holmes, Lond.; Mr. F. Hubbard, Lond.

J.—Dr. H. W. Jones, Liverpool; *Journal of the American Medical Association*, Chicago; Mr. C. L. S. James, Lond.

K.—Mr. G. L. Keynes, Lond.

L.—Dr. T. Lewis, Lond.; Dr. A. Loxton, Birmingham; Mr. E. C. Lewis, Lond.; London Royal Free Hospital School of Medicine for Women.

M.—Dr. D. McAlpine, Lond.; Messrs. Masson and Co., Paris; Prof. J. J. R. Macleod, Paisley; Ministry of Pensions, Lond.; Mrs. M. McConnel, Petersfield; Mr. W. F. Menzies, Cheddleton; Mr. G. Mayall, Bolton; Dr. T. W. Mitchell, Hadlow.

N.—Dr. J. T. C. Nash, Norwich.

P.—Dr. A. L. Punch, Lond.; People's League of Health, Lond.

R.—Dr. F. Roeder, Vienna; Dr. J. A. Ryle, Lond.; Research Defence Society, Lond.; Mr. I. G. Roy, Greenock; Royal College of Physicians, Edinburgh.

S.—Prof. W. Stirling, Manchester; Save the Children Fund, Lond.; Dr. W. G. Spencer, Lond.; Canon J. Shearme, Ryde; School of Physic in Ireland, Dublin, Registrar of; H.M. Stationery Office, Lond.

U.—University of London, University Extension, Registrar of.

W.—Dr. R. Worth, Lond.; Mr. W. H. Wood, Leeds; Mr. B. Whitehouse, Harborne; Mr. V. G. Webb, Tring; Messrs. Williams and Wilkins Co., Baltimore; Mr. A. R. Walker, Lond.; Dr. C. H. Whiteford, Plymouth; Sir C. G. Watson, Lond.; Dr. C. Westman, Lond.

Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

A Lecture
ON
BODY AND MIND.

Delivered at the Thirty-first Congress of the Royal Sanitary Institute held at Birmingham on July 19th to 24th, 1920,

By Sir FREDERICK W. MOTT, K.B.E., F.R.S., M.D., F.R.C.P. Lond.

Mr. President and Gentlemen,—When I was asked by the Royal Sanitary Institute to give the lecture at the meeting to be held in July in Birmingham I considered what subject I could deal with to the best advantage from my own personal experience—as physician for 30 years to a large London hospital, as pathologist to the London County Council asylums for 25 years, and as chief neurologist to the Neurological Clearing Hospital, London, during the whole of the war and since. "Body and Mind" was the subject I selected, for this reason—that no real progress can be made in the study of the mind, in health and disease, if either the mental or the bodily part of man's nature is studied apart, one to the exclusion of the other, for they are indissolubly united.

The experience of the war and its aftermath has taught us one great lesson. That there is a large number of men and women who, owing to an inherent or acquired neuropathic temperament, are unable to make or sustain the necessary mental adjustments to enable them to be of military or civil worth in the military or civil occupations in which they have been or are at present engaged.

There is an After-Care Association which does admirable work in looking after the feeble-minded and those who have been discharged from asylums, but what I think is of more importance is a Before-Care Association, to help the great army of inefficients suffering with no obvious bodily disease or defect; such are individuals suffering with neurasthenia, anxiety neurosis, psychasthenia, mild cases of mental depression and mania, hysteria, hypochondriasis, and epilepsy; also particularly those who are still suffering from the effects of shell shock, hysteria, and other war neuroses.

The functional paralyses, tics, tremors, blindness, deafness, mutism, and other functional disabilities occasioned by the stress of war and emotional shock in neurotic or neuropathic individuals were, from a psychological point of view, biological protective reactions of the emotion of fear by unconscious suggestion, affording a mode of escape from an intolerable situation. The intolerable situation I refer to is trench warfare. Since these functional disabilities were produced by suggestion, they could be, and were, cured by contra-suggestion and persuasion. I have been astonished at the ignorance of many of my professional brethren regarding the diagnosis and treatment of these functional cases.

At the Maudsley Hospital we have cured hundreds of soldiers and pensioners in a few minutes, a few hours, or a few days, who had been in hospitals and convalescent homes months or years, and who, owing to ignorance of diagnosis, had been treated for organic disease by massage and electricity, carried out frequently by sympathetic ladies on the "poor dear" principle, under the direction of medical practitioners unacquainted with neurological and psychological medicine.

Again, surgeons have treated numbers of functional orthopædic disabilities by the application of expensive and elaborate apparatus, often of the most ingenious nature. The result of their ingenuity, however, was only to suggest to the mind of the patient organic disease, and firmly instal the idea of the existence of a permanent disability and pension for life. The existence and cure of this class of functional case is certainly as old as Christianity, and probably much older. Functional neuroses and psychoses exist among savages and primitive peoples in all parts of the world, frequently taking on a local colour.

No New Nervous Disease in War Neuroses.

The war has produced no new nervous disease; it is the same hysteria and neurasthenia which neurologists knew before the war, and which were curable by the same methods. A fact brought home to all those who have had the care of war psycho-neuroses is that the signs and symptoms of hysteria and neurasthenia of men who have been to the front and have been invalided home (except those in which there has been definite evidence of cerebral or spinal commotion or concussion, burial, or gassing) in no way differ essentially from the signs and symptoms of hysteria and neurasthenia of soldiers who have never been out of England. In support of this statement I may mention that I have seen both hysteria and neurasthenia arise from the fear of conscription, or, having been conscripted, an hysterical crisis, contracture, or paralysis has occurred when it became known that the conscript would be in a draft for general service abroad.

Again, inoculation has been followed by hysterical paralysis. I may mention one case which was recently sent to me. He was inoculated in March, 1915, and a quarter of an hour after he lost the use of his legs. He was sent to various hospitals and brine baths. He was then boarded out of the army and received a pension of £2 12*s*. per week for himself, his wife, and family. He was sent to me by the Chelsea Pensions Board, arriving with crutches and a contracted knee. He was induced by contra-suggestion and persuasion to walk in half an hour, and in a week was discharged cured.

I have observed that hysterical manifestations, especially mutism, paralysis, and contractures, are much more frequently met with in the men than in the officers. The latter more often suffer with an anxiety neurosis.

Severe Shock May Induce Hysterical Manifestations in a Neuropotentially Sound Individual.

The great importance of the inborn or acquired neuropathic tendency in the production of the symptoms and signs of hysteria and neurasthenia cannot be over-emphasised. At the same time it must be admitted that shock, and by this I mean not only commotional but emotional shock, due to terrifying or horrifying conditions of war, may have induced hysterical manifestations in a neuropotentially sound individual, in fact, in a soldier who, by his record, had shown that he was neither of a timid disposition nor had any neuropathic tendency.

Automatism and somnambulism, like the hypnotic state, is caused by a dissociation of the field of consciousness from perpetual stimuli, and is regarded as a characteristic symptom of hysteria. Yet cerebral commotion, caused by the bursting of a large shell, may, as the following case shows, bring about in a neuropotentially sound individual a condition of automatism:—

Battle Hypnosis.

"A captain was admitted under my care, and gave the following history: His company had dug themselves in, in a wood; he went out into the road to see if a convoy was coming, when a large shell burst near him. It was about 2 o'clock in the morning, and quite dark; about 4.30 A.M. it was quite light, and he found himself being helped off a horse by two women, who came out of a farmhouse. He had no recollection of anything that happened between the bursting of the shell and this incident."

The anxiety neuroses and psychasthenia with obsessions which have been and still are affecting so many people, both in military and civil life, are neuropathic functional disorders which cannot thus be rapidly cured by suggestion and persuasion. The sufferers with these functional disorders are frequently quick-brained, intellectual men and women in all grades of society, and these are suitable subjects for psychotherapy. The doctor who has a knowledge of psychological medicine and makes it his business to study the desires and motives which determine conduct, and who is able to establish that sympathetic relation with his patient whereby he gains their confidence, is able to uproot from the mind an anxiety causing a mental conflict, for which the patient is continually, but unavailingly, striving to make adjustments. The

continuous mental conflict from which the patient affected by an anxiety neurosis suffers goes on during sleep, exhausting his nervous energy and leaving him unrefreshed, depressed, and despondent on awaking. This mental conflict which the experiences of the war and the dreams of soldiers of their terrible experiences have brought home to us in a vivid manner reacts unfavourably upon all the bodily functions; thus a vicious circle is established in which the *joie de vivre* can only be restored by removing the cause of the anxiety and improving the bodily health. Now that the terrors of the war and their effects on the mind are passing away we have the aftermath of the war and the persistence of a widespread anxiety neurosis occasioned by a contemplative fear for the future of self, of wife and family, in a large number of officers and men with an inadequate or deferred pension and no employment. Many of these officers and men joined up early in the war, before entering an occupation or completing their training in it. No wonder, then, that a widespread spirit of discontent exists among ex-Service men, in spite of the fact that rather belated endeavours in mental hygiene are being made by the Government to establish Training Centres for education, re-education, and social rehabilitation. The nation is only beginning to realise that we can never go back to the pre-war conditions.

OBJECTIVE PSYCHOLOGY.

Before, however, I proceed to discuss some of the practical problems of mental hygiene, I will briefly consider the modern trend of objective psychology.

The furniture of the mind is the memory of the experiences of our life and of the bonds that unite them; there can be no mind without memory, and no memory without body. The furniture of the mind of primitive man consists largely of the memory of experiences connected with the primal instinctive activities of nutrition, by capture of food, of self-preservation and avoidance of pain, of reproduction, and of the instinct of the herd. The civilised man is able not only to store up and utilise his own experiences, but by means of language and abstract thought, to associate these experiences with those of innumerable other human beings, who live and have lived, and thereby to reason on a much higher plane, and utilise his psychic energy in a multitude of refined ways for the ultimate ends of the primal instincts.

The Freudian school of psychologists assert that all psychic energy has its roots in sexual instinct, and they maintain that the sexual life of the individual begins its development at birth or even before birth. Dr. W. McDougall, in the last edition of his "Social Psychology," has added a chapter on the "Sexual Instinct," and he now recognises that sexual experience and conduct afford the most obvious support of the biological theory. He remarks that the energy of the sex impulse, if it is not expended wholly in its own channels of expression, may reinforce intellectual activities, and thus function in situations that make no direct appeal to the instinct. Such indirect utilisation of this primal instinct as a great source of psychic energy, available for other than purely sexual activities, is the process which Freud terms sublimation.

McDougall recognises the general truth of this Freudian doctrine, without, however, committal to the acceptance of all, or, indeed, any, of the other doctrines of the "sex impulse" of Freud, and I am in agreement with him that the theory of the sex instinct serving as the great source of psychic energy is a fundamental principle of biological psychology. The psychic energy derived from the sex instinct is the *élan vitale* which bursts forth in youth, and is so well and poetically described by Shakespeare in *Romeo and Juliet* in the lines:—

> "My bosom's lord sits lightly in his throne;
> And all this day, an unaccustomed spirit lifts me
> Above the ground with cheerful thoughts."

Every intelligent human being is continuously engaged in the practical study of psychology, although he may be as unconscious of the fact, and, moreover, as surprised when he is told, as Molière's "*Bourgeois Gentilhomme*" was, when he discovered that he had been talking prose all his life. For do we not all judge by analogy the feelings and motives of others by observing their conduct, their facial expression and gestures, a universal language of the emotions which is often a truer indication of the passions and motives passing in the minds of our fellow-men than is revealed by speech, which often, as Talleyrand said, was given to man to hide his thoughts.

All the desires and impulses which move human beings to action have their source of psychic energy in the four primal animal instincts of nutrition or capture of food, self-preservation, the sexual instinct, and the herd instinct. All feelings, thought, and action, whether individual or collective, have their source in these essential springs, out of which flow the mental streams and rivers of individuals and nations.

In the higher animals there are few purely instinctive modes of behaviour unmodified by intelligence and by habits acquired under the guidance of intelligence and imitation. Man, owing to the great development of his brain, his erect posture, strength, and symmetry of the body, together with the hand, as instrument and instructor of the mind, has been able to make an infinite variety of sensory-motor adjustments and reactions to environment for the conservation of the individual and the preservation of the species. By the acquirement of refined means of inter-communication of his thoughts and feelings, firstly by a language of emotions and later by an articulate language of intelligence and abstract thought, he has, within comparatively recent times, built up a social heritage. But it is doubtful whether this has been associated with any structural change or increased development of the brain; although without this social heritage he could never have attained the power he has obtained of controlling the forces of Nature.

Compared with countless ages man has existed on the earth feeling, thinking, and acting in response to the gratification of the desires of these primal instincts, the oldest known civilisation is but as yesterday to many years.

EVOLUTION OF THE SEXUAL INSTINCT.

When we realise that the intellect of man in the process of evolution has within comparatively recent times been superimposed upon this strong animal instinct, the gratification of which is attended with intense pleasure and its repression with mental pain, and, further, when it is considered that social progress and conditions of modern civilisation tend more and more to frustrate the end of this strong instinct which Nature designed for the preservation of the species, a disharmony arises which not only endangers the happiness and contentment of mind of numbers of civilised human beings, but also threatens the race with decay. Seeing that culture and civilisation cannot suppress this vital force of the sex instinct, its control has been, is, and must ever be, a difficult problem for the race; and as McDougall says, the difficulty increases rather than diminishes with every forward step of civilisation and every increase of far-sighted intelligence over the immediate promptings of human nature.

The herd instinct in man is intimately associated with the sex instinct in this problem, for the bond of union of the herd is a willingness on the part of each member to sacrifice individual interest and life in the interests of the herd; self-preservation thus becomes secondary to preservation of the species. This is well exemplified in the social instincts of bees and ants and gregarious animals.

Primitive man and still more civilised man, have evolved social usages and customs connected with the sex instinct which have become traditions in the tribe or race, allegiance to which serves as a further bond of union, and every individual who desires to be esteemed and his conduct approved, must conform to these traditional customs and usages and the penalty of thinking rationally, of thinking differently, and of thinking and acting independently is to court disapproval, disfavour, or of being thought not respectable. Yet, as Maudsley says, "How inestimable, then, the service rendered to mankind by the few who can think, and, thinking, do differently from the herd." A truth which Prince Henry appeared to appreciate when he sarcastically

complimented Poins: "Thou art a blessed fellow to think as every man thinks; never a man's thought in the world keeps the roadway better than thine." (2nd Part *King Henry IV.*, Act 2, Sc. 2.)

But what is the solution of this sex problem? Early marriage is what Nature intended, and this is poetically expressed in the philosophy of Shakespeare when, in the Sonnets, he is advising a young nobleman to marry and propagate thus:—

"Upon the earth's increase why shouldst thou feed
Unless the earth with thy increase be fed?
By law of Nature thou art bound to breed
That thine may live when thou thyself art dead.
And so in spite of death thou dost survive
In that thy likeness still is left alive."

Religions and traditions from time immemorial have centred around the sex instinct; this is strikingly illustrated in the worship of the Virgin and Child, symbolic of chastity and the tender emotions.

All the higher, as well as the baser passions and sentiments have their source in the sex instinct. Painting, sculpture, music, romance, literature, and the drama owe their inspiration and fervour to the sexual passion; yet social traditions and customs of the herd have, in the past, conspired to throw a veil over the tree of life, the openly expressed knowledge of which has been regarded as the forbidden fruit. Social conditions tend to repress the supreme end of this instinct, especially in women. When this happens the psychic energy of the instinct is not suppressed; it may be repressed and cause a silent current of sexual desire and passion which, although not manifest to the external world, nevertheless occupies a large place in the conscious and subconscious self, causing mental suffering, with its special emotional tone which finds outward expression in æsthetic forms or religious observances.

The aim and object of a civilisation should be, then, to encourage early marriage of people of civic worth by provision of houses, of a wage or income sufficient to maintain a wife and family, and by the removal of all restrictions to suitable marriages and the upbringing of children. It is certain that overcrowded dwellings and domestic discomfort lie at the root of many social evils. With the present conditions of our social system, however, marriage is possible only for a certain proportion of the population, but the sex instinct cannot be suppressed. In some the psychic energy may be diverted into other channels—e.g., the young may be encouraged to utilise the energy in sport, work, and intellectual occupations, but in spite of such diversion, moral teaching, and fear of consequences, large numbers of both sexes cannot control the impulse and do not remain chaste, consequently promiscuous intercourse and prostitution, with all its attendant evils, continue. It is of no use hiding this fact; the war has clearly shown the truth of this statement. Venereal disease was, and is, still raging in our midst. A hopeful change, however, came over the public, in a great measure due to the fatal emergencies of the war, backed by a strong expression of opinion from our Colonies, that prophylactic measures had to be taken to prevent this scourge in our midst becoming worse.

The "Hidden Plague."

Seven years ago venereal disease could not be discussed in the public press, in spite of the fact that our hospitals, infirmaries, asylums, and institutions for the deaf, the blind, the paralysed, the imbeciles, and the idiot contained a large proportion of inmates suffering with incapacitating or fatal disease directly or indirectly due to venereal infection. And in spite of the fact that large numbers of innocent women and children were the sufferers, and in spite of the knowledge that a large proportion of the abortions, miscarriages, children born dead, as well as sterility in women, was the result of infection. The public had not yet learned to follow Dr. Johnson's adjuration to clear the mind of cant. Then came the International Medical Congress in London, and the discovery of a new method of treatment of what had been euphemistically called in the press the "hidden plague." Fortunately to be hidden no longer, for a Royal Commission was appointed, of which I was a member, and it was proved that the registration of causes of death, which had been relied upon by politicians, instead of revealing the fatal effects of venereal disease, obscured them. The evidence showed that 1 in 10 of the adult male population had been infected with syphilis, and a far larger percentage with gonorrhœa. The evidence proved that there was not an organ or tissue of the body which was not liable to be diseased on account of it, and that its most incapacitating and fatal effects fell upon the most vital structures—viz., the heart, the blood-vessels, the spinal cord, and the brain. Statistics proved that 10 per cent. of persons infected, in spite of treatment, had subsequently died of softening of the brain or other nervous disease, after having been paralysed or demented for years.

It was hoped that the recommendation of the Commission, supported later and energetically carried out by the National Council for Combating Venereal Disease, would, by the establishment of early ablution treatment centres throughout the kingdom, be able to deal effectively with venereal infection and prevent the spread of the disease. Unfortunately, many borough councils and county councils, including the London County Council, do not regard these early ablution treatment centres as practical, or at any rate refuse to adopt this means of combating venereal disease. Numbers of eminent medical men, some of whom were originally members of the National Council, realising the impracticability of early treatment centres, desire to see the same method of immediate self-disinfection adopted for the civil male population, as was successfully practised in the army by Sir Archdall Reid at Portsmouth. The treatment he employed was a simple disinfectant—1 part in 1000 of permanganate of potash.

Public opinion has changed, for a whole column of a recent issue of the *Times* was given to the subject "Venereal Disease, Self-Disinfection Problem. Deputation to the Minister of Health."

The President of the Society for the Prevention of Venereal Disease, Lord Willoughby de Broke, read the following resolution of the Society:—

That inasmuch as the Ministry of Health has failed, and public bodies (including the London County Council) have declined, to provide the means of delayed disinfection against venereal disease at ablution centres, this meeting calls upon the Ministry of Health and upon local authorities to instruct all qualified chemists to sell such means of immediate self-disinfection against venereal disease as may be approved from time to time by the Ministry of Health or by medical officers of health.

Whilst giving a sympathetic hearing to the deputation, the Minister expressed the opinion that before he adopted any of the suggestions submitted to him he had to be satisfied that any change he made was in the right direction. The department was anxiously watching the experiments that were being conducted, and he would seriously consider the proposals put forward for self-disinfection.

It is argued that there is no evidence of a recent increase of venereal disease, but that larger numbers of people attend the treatment centres; and in support of this fact it is claimed that general paralysis of the insane and locomotor ataxy, both of which are, in all cases, the direct result of the syphilitic organism invading the nervous system, have not shown an increase; but this argument is entirely fallacious, for the average time after infection, when these diseases manifest themselves, is ten years. There is strong evidence to show that the reason why these late fatal syphilitic diseases of the nervous system are so common among civilised people is that the organism has become modified owing to the widespread use of mercury in treatment, and seeks the nervous system, where it is protected from the effects of the drug. These diseases, general paralysis and locomotor ataxy, are seldom met with in countries where syphilis has been recently introduced.

The reasons advanced why this scientific knowledge of early disinfection should not be employed is the fear that it will increase immorality. Of course, every right-minded man would say that either chastity or marriage is the only safeguard, but I have given strong

reasons why, in the present social conditions of our people, we can hope for neither of these moral conditions becoming universal. Why should we wait till the syphilitic organism has entered the body before attempting to destroy it? Every delay diminishes the hope of eradicating the disease and preventing its spread, and we have to consider the innocent women and children, the dead and the unborn hundreds of thousands of babies. If in other diseases we, as doctors, make every endeavour to destroy the germ before it can colonise in the body and cause a constitutional disease, why not in this disease? I appeal, therefore, to this Sanitary Congress to support the propaganda of the Society for the Prevention of Venereal Disease for the following reasons:—

(1) If the experience of the war has shown that it is impossible for numbers of men to be sexually moral, is it not desirable that they should be made to feel the responsibility of contracting the disease and transmitting it to innocent people? The only practical way in which I can see this can be done is by instruction in immediate self-disinfection.

(2) Early treatment centres are not likely, for obvious reasons, to be used by numbers of men after exposure to infection, and again, there will often be fatal delay before the treatment centres can be reached.

(3) The cost of self-disinfection is borne by the individual, whereas the taxpayer has to pay for treatment centres.

I have seen, in the London asylums, thousands of men and women die from general paralysis of the insane. For 20 years I have endeavoured to make the profession and the public realise that if there were no syphilis there would be no general paralysis or locomotor ataxy. To show the effects of syphilis in the production of fatal and incapacitating nervous disease and paralysis I will cite an experience of only last week. I went to a London infirmary to give a clinical lecture to my class on nervous diseases then being treated in the institution. There were five cases among the women suffering with severe organic nervous disease, and four out of the five were due to syphilis. The frequency with which syphilis acts as a cause of fatal and of disabling organic disease is known to every hospital physician.

The destructive effects of syphilis on the brain is the best example I can offer of the effects of bodily disease upon the mind. The loss of mind is proportional to the destruction of the hemispheres of the great brain, which is the anatomical substratum of consciousness and memory, and in the last stages of which the sufferer with this disease leads a mere vegetative existence.

THE HERD INSTINCT AND THE SUGGESTIBILITY OF MAN.[1]

The gregarious instinct is to follow a leader. Sometimes this is advantageous, sometimes disadvantageous, both in peace and war. The dancing mania of the Middle Ages was a striking example of the effects of suggestion; we see it every day in crowds that will collect at the most trivial incident; indeed, if a person stood in the street and gazed up at the sky, although nothing was to be seen, his action would soon be imitated by numbers of people. In war, this suggestibility may be advantageous or the reverse. A British general is said to have remarked that 10 per cent. of a regiment would fall down or run away, 10 per cent. would follow you to the gates of hell, and the remainder would follow either. It is obvious, therefore, that the men with nervous or timid temperaments are a positive danger, and it was for this reason doubtless, that some of these men, in the earlier years of the war, were tried by court-martial and shot for cowardice. Conscription of large numbers of neuropotentially unfit men, who never could make soldiers, was subsequently found to be a mistake. Morever, it was found to be a mistake to send officers and men back to the front who had been sent home suffering with shell shock, neurasthenia, or hysteria. Nervous or mental inferiority was not considered sufficiently as a cause of rejection for general service, and the nation is paying a heavy price in the matter of pensions in consequence thereof. Does not this clearly show that some psychological training of medical men is necessary, especially when we remember that one-third of the unwounded in 1917, discharged as unfit for service, were men suffering with war neuroses and psychoses? It also shows what experienced neurologists know, that a large proportion of the civil population are potential neuropaths or psychopaths, and that this branch of medicine should be taught more efficiently.

I am glad to see that the Royal Sanitary Institute has recognised the importance of psychiatry in sanitary science by initiating a discussion on psychiatric clinics. We have learnt that a mentally sound individual does not become insane by the stress of war; nor does stress produce mental deficiency. The war has taught us that the neuroses, insanity, epilepsy, and mental deficiency are inborn, and the stress and strain of war have merely revealed or accelerated their onset. A long experience as pathologist to the London asylums and a study by a card system of 4000 near relatives, who have been or who are still inmates, showed conclusively the importance of the hereditary factor. The experience of the war has supported this conclusion. A striking illustration is shown in the case of 10,000 Serbian prisoners who were subjected to famine, stress, and severe bodily diseases—e.g., typhus, typhoid, and tuberculosis—yet only five suffered with insanity. But not only are the psychoses (that is, insanity), but the neuroses are markedly hereditary, and as Dr. John Macphersen, the Scottish Commissioner in Lunacy, has pointed out, "the hereditary disease is transformable, neuroses appearing in the antecedents and collaterals of the subjects of the psychoses, and vice versa, from which we may imply a common hereditary basis." They constitute genetic variations from the normal, in respect of a hyper-excitability of the sensori-motor elements, owing to a narrow margin of the highest control of the brain, which renders the subjects susceptible to mental suggestion or to physical or mental impressions which do not similarly affect normally stable individuals. The symptoms usually commence to manifest themselves in early life, childhood, or adolescence. "The neuroses have no geographical or racial limit, but affect individuals of all human races, and, so far as that is possible, of several of the higher animal series."

ALCOHOL AND ITS INFLUENCE ON BODY AND MIND.

Alcohol, like syphilis, is a race poison, and affects every organ and tissue of the body. It is rapidly absorbed into the blood, and it passes from the blood into the fluid that surrounds and bathes the central nervous system; its first and immediate effect is as a narcotic upon the higher controlling centres of the brain; consequently, owing to its widespread abuse, it is the most important cause of disorders of conduct and crimes of violence, as prison statistics show. It is not so potent a cause of insanity as asylum statistics would seem to indicate. Why, then, is it assumed to be such a cause of increase of insanity? Firstly, because the data upon which the statistics are made are unreliable. Secondly, because potential lunatics, epileptics, and the feeble-minded have only a narrow margin of highest control, and a relatively small quantity is sufficient to make them antisocial, and thus reveal the unsound mind, so that they become certifiable. In support of this conclusion I would draw your attention to the following facts: I compared the results of 2000 post-mortem examinations, which I made at Claybury Asylum, with 2000 post mortems in Charing Cross and St. George's Hospitals, and whereas cirrhosis of the liver with dropsy very seldom occurred among the insane, it was a very frequent cause of death of the sane in hospitals. The inference is that the potential lunatic can seldom drink large quantities of alcohol for any length of time without his unsound mind becoming revealed. There is no doubt that persons who have suffered with head injury or brain disease are intolerant of alcohol. Alcohol and syphilis work together in undermining the constitution. Alcohol plays an important part in the spread of venereal disease. Many

[1] Those who are interested in this subject should read the philosophical work of Mr. Wilfrid Trotter, "The Herd Instinct in Peace and War."

a good man's life has been wrecked by loss of self-control on one occasion only—when he has indulged in excess of alcohol.

Control of the liquor traffic, especially of the sale of spirits, is necessary in the public interest, but I do not favour total prohibition. The sale of alcoholic beverages in the form of light beers and wines seems to be a reasonable mode of dealing with the question, and not likely to cause the widespread discontent that total prohibition would.

MENTAL HYGIENE AND THE TEACHING OF PSYCHOLOGICAL MEDICINE.

In America, for the past three years, there has been a very active development in the study of mental hygiene, and a quarterly journal dealing with the subject in all its aspects has been published by a National Committee of Mental Hygiene of which Mr. Clifford Beere is the secretary. He wrote a remarkable book entitled "A Mind that Found Itself." In this he gives his experiences of the treatment of his mind when it was unsound, and points out how illogical it had been. The objects of this national committee are to help both the physician and the patient; also to befriend the patient's relatives, to whom, when burdened with an actual or impending affliction, it would become an unfailing source of information, advice, or comfort. In a word, it would be a friend to humanity, and upon these lines this Committee of Mental Hygiene and its centres of activity have been doing most valuable work in the United States. It is such a "Before-Care Association" that we want in this country.

The war has shown the great need of systematic teaching of psychological medicine as a part of the medical curriculum. In 1907 (Vol. III., *Archives of Neurology and Psychiatry*) I strongly advocated this teaching for post-graduates, and suggested that a diploma of psychological medicine should be instituted, for I felt sure that it would raise the tone of medical men employed in the care of the insane and lead to diagnosis and better treatment of mental disease in the early curable stage. I also advocated the establishment of a psychiatrical clinic in London, where the incipient and borderland cases could be seen and treated.

In a recent number of THE LANCET,[1] in an annotation on the Genesis of the Maudsley Hospital, the statement I made is quoted in full, and the article goes on to say that there is good reason to believe that it was this desire on my part to see a hospital in London for the study and treatment of neuroses and insanity in the early stages which induced Dr. Henry Maudsley to give £30,000 to the L.C.C. to build such a hospital. Unfortunately, this great physician, philosopher, and philanthropist died a few years ago, before the hospital, which is named after him, was fulfilling the objects which he contemplated. However, it did most valuable service during and after the war, and I hope that soon the Ministry of Pensions, who are at present using it, will be able to hand it over for civil use. I was convinced in 1907 that the institution of a diploma in psychological medicine would prove as valuable to that branch of medicine as the diploma of public health had been, and I called upon the President of the Royal College of Physicians to try and induce the Royal Colleges to give such a diploma, but I was quite unsuccessful. Just prior to the war the Cambridge University led the way and instituted such a diploma, and now many universities and the Royal Colleges give diplomas of psychological medicine. What is now required is the systematic teaching of the subject. For the past three months a course of psychological medicine, which will occupy six months, has been in operation at the Maudsley Hospital, under the direction of the L.C.C. The course has been designed for either the University of Cambridge diploma or for that of the Royal Colleges. I am pleased to say that a class of 36 post-graduates have attended.

THE NEGLECT OF MEDICAL PSYCHOLOGY.

Sir George Newman, in his recent admirable report on Medical Education, states: It is deplorable that the English student of medicine should have no opportunity of learning modern methods of psychiatry or of diagnosing incipient and undeveloped cases of mental disease. And yet, in 1913, Parliament imposed statutory duties upon the medical practitioner, among them being: "He must be competent to diagnose all forms of mental disease" (Mental Deficiency Act, 1913). The public might ask, why did not the authorities previously insist upon proper training in this important branch of medical education, involving the liberty of the subject? The effects of this neglect of training in this important branch of medicine was shown in conscripting for the war. In the report of the Ministry of National Service physical fitness and unfitness only are considered.

It is difficult to understand, in the face of the report of Sir George Newman and war experience, that in the report of the Consultative Council on Medical and Allied Services, the scheme referring to the equipment of the Secondary Health Centres, Provision 57, does not include any department of neurology and psychiatry, although other and less important special departments of medicine are provided thus: skin, ear and throat, eyes, genito-urinary, dental, and industrial hygiene. Possibly, having regard to the fact that Dr. Addison, in a preface to my work on "Shell Shock and War Neuroses," fully recognises the importance of the subjects, the Ministry of Health may have in view some special scheme of dealing with neurology and psychiatry.

The importance of psychotherapy has been realised in the university of this great city, for courses of lectures have been given on this important subject by two leading authorities, Dr. Bernard Hart and Dr. W. McDougall. Academic psychology is not of practical importance to the medical man, although the knowledge of it is helpful; it is the study of conduct and its disorders considered biologically, as set forth by the late Dr. Mercier, which should engage his attention, and in conclusion I would remind my audience of the words of Francis Bacon, in his "De Augmentis," when he pleads for a study of mind and character: "That so we may have an accurate dissection of men's minds and characters, and the secret dispositions of particular men may be revealed, and that from a knowledge thereof better rules may be made for the treatment of the mind."

[1] THE LANCET, March 13th, 1920, p. 618.

SOME ASPECTS OF FUNCTIONAL NERVOUS DISEASES.

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THE complicated, contradictory, and fluid views currently expressed as to functional nervous diseases, affections bordering upon definite mental disorder and established insanity, must prove exceedingly bewildering, not only to the practitioner of general medicine, but also to those who particularly devote themselves to neurology and psychiatry. In the study of the ætiology of such affections it was not so long since that endless time and tireless energy were devoted to the search for structural alterations of tissues examined post mortem and to the examination of the cytology and chemical composition of such fluids as are available for examination during life. Even now laborious works are being compiled and published full of descriptions of minute changes in the cells and in the chemical composition of fluids derived from cases of nervous and mental disease, but more striking, at least in bulk and novelty of content, is the gigantic output of literature of the last 20 years bearing upon psychology, normal and morbid, which contains little or no reference to anatomical findings and indeed not infrequently explicitly ignores them. The mind has come to be regarded as almost independent of the body, while the investigation of its processes is carried on solely in the psychological field. Many symptoms which not long ago were held to be due to faulty biochemical reactions are now ascribed to the ill-adaptation of mental processes.

Anyone who has watched phases of the development of medical science and art will have been struck by the similarity of the genesis of fashions in therapy. A new idea is mooted and is almost at once carried to logical extremes by those who are of the imaginative and sanguine type of mind which especially loves "to tell or to hear some new thing." For instance, I remember when some years ago I set forth in a paper that a certain micro-organism had been discovered in a case of a certain disease, that I received the day after publication a wire asking for a curative serum for use in its treatment. On the other hand, we find a type of mind common and probably more widely diffused, though as a rule less voluble, which strongly and almost angrily resents the upset and readjustment of ideas involved in novelty. There is a third type, of which there are but few examples, in which criticism follows hard upon discovery, and in which ardour for the hypothetical is moderated by patience and cooled by experience. The protagonists clash in that which is obviously a welcome conflict and the din is deafening, while the small voice of genuine inquiry is only heard when they are exhausted by their vociferations or have found some new thing to interest them. In the field of functional nervous disorder we are still in the midst of the battle, but it may be worth while to attempt very briefly to set forth the position to which we have been carried.

Disease With or Without Structural Alteration.

By organic disease we mean that some alteration of structure has occurred, and that this alteration has been associated with a disturbance or cessation of function. There are also disorders in which structural alteration is not at all obvious, but of which physical agents are generally recognised as the cause, for instance, the affections which result from intoxication either by bacterial products or by poisons of other origin, from the effects of climate, or from those numerous circumstances which result in symptoms of exhaustion. In these affections in order to produce a cure it is generally enough to remove the causative agent. There remain, however, disorders of the various systems of the body in which structural alterations have not been decisively demonstrated, and about which the opinion is general that there may be none to demonstrate. In these disorders ætiological factors are obscure and do not appear to include physical agents among them, while physical agents used therapeutically appear to be of little or no value. The literature of the last century is strewn with the endeavours which were continuously being made to discover among physical agents the causes of functional nervous disease, and innumerable physical agents, including drugs, hydrotherapy, electrotherapy, rest, isolation, diet, climate, gymnastics, and metals were used in their treatment. So many and divergent have been these methods that some suspicion has been aroused as to the value of any of them. Confusion has also arisen from the fact that an agent apparently of value in some cases and in some hands has produced little or bad or no effect in other cases of a seemingly identical character. The problems which have thus arisen have of necessity turned men's minds in another direction, and it has been sought to discover whether mental processes might not, at least in some cases, eventuate in physical disorder, and whether many somatic symptoms might not be in fact the expression of disordered mental operations. These surmises were fortified by a consideration of the many therapeutic systems mostly extra-scientific and practised by those who were not trained as professional physicians. Miracles of undoubted authenticity and genuineness have been recorded from the earliest times, and though sometimes associated with physical agents have not been associated causally with them and have appeared for the most part to have been produced by the effect of the expression of the performer's mentality upon his patient. During the early part of the nineteenth century, owing to the work and reputation of Mesmer, the idea of the mind cure became extremely prominent, and various synonyms for mesmerism, such as hypnotism and suggestion, have marked attempts to raise the empiricism of Mesmer's procedures to a more scientific level. In the latter part of the last century arose the colossal movement known as Christian Science, the basic idea of which is the supremacy of the mind in its own and in the physical fields. In this case also the endeavour to raise empiricism to a scientific level has been an important stimulus of psychological research in the causation and cure of the somatic effects of psychic disturbance, and in the essential character of the disturbances themselves. Whether the causation of any affection be regarded as of physical or psychic origin, general principles of treatment still hold good—that is to say, the discovery, where possible, of the exciting cause and its removal, the neutralisation of its ill-effects, or where this is not possible, their palliation.

The therapeutic principle of palliation of symptoms of psychic origin is perhaps best exemplified by the method derived from the Stoics of inducing in the patient's mind a contempt of his bodily suffering, and a reliance on such fortitude as he can muster. The neutralisation of symptoms is exemplified by the method of suggestion under hypnosis in which injunction not to have certain symptoms sometimes results in their disappearance. The most truly radical mode of treatment, however, lies in the attempt to discover the mental irritant and to remove it. These modes of treatment have each of them ardent exponents, and any one of them would appear from current literature to be capable of the cure of all functional nervous diseases. In practice, however, these methods are discovered to be inextricably confused, to overlap and not by any means always to eventuate in the hoped-for results, while the time and labour involved both for patient and physician not infrequently render them impracticable.

Physico-genetic and Psycho-genetic Causes.

The causes of functional nervous disease may be divided into those which are physico-genetic and those which are psycho-genetic. Among the physico-genetic causes are the toxins of the bacterial infections and of intestinal stasis, the poisons manufactured in the body by faulty metabolism, as in gout and diabetes, poisons taken into the body, for instance, alcohol and morphia, and the excessive or defective amount of the secretion of the endocrine glands or its defective quality.

The psycho-genetic origin of certain functional nervous and mental disorders has been long and universally recognised. Before the physico-genetic causes were in the last century especially stressed, delirium, mania, melancholia, and delusions had been regarded sometimes as due to direct possession by the devil, and at others as the punishment of sin or the manifestation of a guilty conscience. The pendulum has again swung in this direction, though nomenclature has altered. Possession by the devil is not held to be a causative factor of functional nervous disease, but mental conflicts as the result of the opposition, on the one hand, of instinct, and on the other of education in its broadest sense is, in some quarters, held to be the basic and often the sole cause. It is a platitude to say that certain events make a more powerful impression than others, and that certain ages are more impressionable than others. Some events make such an impression that they are associated with the phenomena of physical "shock." Persons who have been shocked in this way often show symptoms which before the war were grouped under the heading of traumatic neurasthenia, and which during the war were given the euphemistic name of "shell shock." Other events do not produce shock but changes of a more subtle character, which may eventuate in states of mind which are not compatible with the instinctive and acquired mentality of the individual. Such states of mind may betray themselves in various ways as symptoms. In some such cases the origin of the symptoms may not be known by the patient, or a supposed origin may not be the true one. As a rough analogy derived from the somatic field may be mentioned the common experience that the dyspeptic often attributes his symptoms to heart disease, and is proportionately depressed by them, and that when their true origin is explained to him he sees how baseless and

unreasonable is the anxiety from which he had been suffering. In addition to the dramatic causation of cases of traumatic neurasthenia and shell shock, there are in all lives potentialities of worry—that is, of mental discomfort, distress, or even pain. Worry may be associated with the home, with the health and character and conduct of relations and friends, with their attitude towards the patient or with his towards them; with the patient's professional career, with the making of name and position; with society, its congeniality or uncongeniality, or with the level which it has assigned to the patient or with the level in it to which the patient aspires; with religion, dissatisfaction with a faith and insufficient faith or scepticism, or the incompatibility of past or present conduct with some ideal standard; with politics and the incompatibility of things as they exist with the imagination of what they ought to be. Such factors as these are often very well known to the patient as sources of worry and as producing disharmony and conflict in his mind. Palliation, neutralisation, or complete abolition may be obtained by amended attitudes of mind and conduct. In some cases, however, the symptoms which take the patient to the physician are not recognised as the result of the worry, or, maybe, the mental disharmony or distress or conflict is not patent and explicit in his mind, and he is only brought to recognise it when the incongruities of his mentality are brought to light and become plain to him. Such an absence of clear recognition on the patient's part of his own mental disturbance may be of the nature of a defence against psychic discomfort or pain, and, in fact, due to the putting aside or repression of that of which the presence is not desired in consciousness. The process of repression appears to imply (1) an unpleasantness or a something to be repressed; (2) a tendency to forget the unpleasant, not necessarily consciously acknowledged, and which would, when it acts very early in life, seemingly amount to an instinctive process; (3) a power to put this tendency into operation and to make it effective; and lastly (4) that which may be called a mechanism of repression, the nature of which is not at present completely understood. That repression is not always absolutely complete is obvious, for if it were no past unpleasantness, whether remembered or not, would cause either mental distress or those symptoms which are alleged to be the expressions of unconscious conflict.

Mental Degeneration, General or Patchy.

In organic mental affections—e.g., general paralysis of the insane, chronic alcoholism, or arteriopathic dementia—there occurs a general all-round mental degeneration. In functional affections the symptoms are not those of an all-round degeneration, but are of a patchy distribution; for instance, there may be imperative ideas, obsessions, delusions, amnesia, morbid anxiety, phobia, anæsthesiæ, palsies, contractures, or such abnormal movements as tremors and tics. It would hardly seem worth while to explore the psychic ætiology of the symptoms of general paralysis, while it is as obvious that the exploration of the psychic factors of the ætiology of such symptoms as those just named must be very important. It should, however, always be remembered that various conditions of lowered physical health make symptoms of psychic origin more pronounced, and in many cases appear to be their direct excitant. This is also especially important in treatment, since the facilities at present obtaining in most neurological clinics as now conducted for prolonged mental examination are but small, and recourse has to be made to some of the crude though useful methods of physico-therapeutics. It is not proposed here to review such methods for the treatment of functional nervous disorders. Rest, isolation, electro-therapy, balneo-therapy, drugs, and careful dieting have their place as useful adjuvants of psycho-therapy in various cases, and as forming a scenic setting for its performance. With regard to modes of treatment whose object is to deal directly with morbid phenomena patently or not of purely mental origin, there are three which command the most attention—namely, suggestion, education or re-education, and analysis.

Three Modes of Treatment: (1) *Suggestion.*

A definition of suggestion has not been generally agreed upon. The term is used in many different senses. The primary meaning of suggestion is the putting forward of an idea with a view to its acceptance by the individual to whom it is proposed. Plainly the methods of proposition may be very varied, but perhaps it is correct to say that in medicine the term means the authoritative proposition of an idea for acceptance without question. Suggestions may be made when the patient is in a condition of artificial sleep or in the waking state. During hypnosis the patient's conscious mind is at rest and suggestions are made to the part of the mind which is not conscious. On the other hand, in the waking state suggestions are made to a part of the mind in which, as it is hoped, criticism is not aroused and in which there is a mental attitude of passive acceptance and obedience. Such appeals to the unconscious or to the unreflecting mind may undoubtedly, at least in some cases, mitigate or abolish symptoms. But it is obvious that in such a method the origin of the symptoms is not explored and their cause persists. There is probably a state of what may be called normal suggestibility, which is the usual one for most individuals, and it is to this normal state that political orators and newspaper editorials, directed towards the influencing of our "psychology," appeal. Most of our "opinions" are probably the result of various influences which have impinged upon us at impressionable periods of life and which are, in fact, founded upon but slight if any real ratiocination. There is also undoubtedly a condition of hyper-suggestibility in which some persons are prone to accept absurd propositions or those which are novel or extraordinary. When sick, or when they think they are sick, such persons try cure after cure simply because suggestion is made to them by advertisement or by enthusiastic friends that the various cures are infallible. It should here be remembered that an alternative name for hysteria is pithiatism, a word coined to express the opinion that hysteria is due to hyper-suggestibility. On the other hand, it is undoubtedly the case that some persons are hypo-suggestible. A few individuals are not prepared to accept propositions unless they are proven, an ideal state rarely, if ever, attained; while others have not reached this ostensibly high intellectual level, but are simply unreceptive of ideas to which they have not been accustomed or which they do not understand. Under treatment by suggestion may, perhaps, be placed a method which has come to be known as that of "shock tactics," in which a ferocious appearance, a hectoring manner, and a faradic current are combined to assure the patient that he has nothing really the matter with him. Suggestion under hypnosis is also used to induce the expression of a mass of pent-up emotion, the result of some direful experience. The memory of the experience has been repressed, with resulting symptoms of functional nervous disease. The patient is told under hypnosis again to live through the experience. He does so, and in so doing gives vent to the emotional expression proper to the experience. Such purgation of his unconscious mind may result in the disappearance of symptoms.

(2) *Education.*

In the therapeutic applications of education or re-education, in those cases where education has been defective or erroneous, appeal is not made to a mind which is not at the time conscious or under the spell of authority, habit, and custom, but is made to the developed and organised power of ratiocination. The appeal is generally by way of explanation and elucidation of symptoms, and an endeavour is made to arouse and develop firstly, a reasonable outlook, and secondly, the self-control which constitutes the normal repressing force. A method by which repression is effected and the power to repress doubtless exist and have been evolved because they have their value.

Just as the physical eye has, during evolution, learnt to see that which is useful for the purposes of the organism to which it belongs, and is neither microscopic nor telescopic in its powers, so has the psychic eye learnt to make its selections, while the rest is neglected as valueless or repressed for its unpleasantness. It is

not, then, unreasonable to suppose that there is in the individual a proper amount of the power of repression, and that in some this power is weak and results in hypo-repression, while in others it is strong and results in normal repression, or perhaps at times in over or hyper-repression. In hypo-repression that which it has been sought to repress may manifest itself in ways which are recognised by the patient as due to his defective power of repression or in ways which are not so recognised, and are expressed as symptoms of functional nervous disease. On the other hand, in hyper-repression in persons of considerable power of ratiocination and self-control, there may, for a time at least, be periods during which symptoms disappear or are tolerable, but there are likely to be other periods when their powers are weakened, perhaps owing to physical illness or to exhaustion, and when that which is repressed may again emerge and indicate its presence in morbid anxiety, in various symptoms of functional nervous disease, or in the tremendous spiritual conflicts of which accounts are frequent in "Lives of Saints." In this mode of treatment, as in treatment by suggestion, the origin of symptoms has not been investigated.

(3) *Analysis.*

In one aspect mental analysis is but an elaborated and systematised method of investigating the causes of functional nervous disease, but by its radical methods it also claims to remove the causes of disease and in this way especially to be of therapeutic value. The treatment of symptoms is held, as in general medicine, to be of less value than the discovery and eradication of the causes of disease. These causes are often of the nature of repressions, which occur in some cases so early that, as it has been observed, it is difficult to determine whether the process is an instinctive one or a result of early education. Repression certainly does occur later in life, when ideas which have been inculcated clash with instincts, or when one set of inculcated ideas clashes with another. In the latter case, at any rate, it is doubtful if it is necessary to carry an examination as far as infancy to discover the repressed idea. But in other cases it would appear that normal psychic growth has not been steadily progressive, and that in some respects it has become stationary, so that a conflict arises between this fixed set of ideas and other sets of ideas which have continued their normal progression.

Some of these fixations and repressions hinge upon the sexual impulse, but it is doubtful if in all cases it is necessary to insist upon such a connexion, at least if the word sexual is to be used in its customary sense. Recently the word has been given an extension which includes the "impulse towards life," relations between parents and children, and ordinary social relations between persons of the same or opposite sex. In the investigation of these relations it is somewhat difficult to avoid the feeling that too great a scope is occasionally allowed to the vagaries of the imagination, for they are extremely difficult to control in scientific investigation. In some cases, interpretations, seemingly wild, are confirmed, but occasionally also such interpretations appear to take the nature of a rather dangerous process of suggestion, the process being recognised neither by the patient nor the physician, and an imaginative interpretation is adopted by both and set forth as the cause of the disorder. Further, it is quite obvious to those having experience of cases which have been systematically investigated that the discovery ensuing from the investigation does not always eventuate in cure, or even alleviation. Failure to alleviate may be ascribed by the physician to his defective knowledge or faulty art, but when he comes across unrelieved cases which have been treated by the able, experienced, and learned, a similar doubt as to the correct nature of the technique cannot be raised, and he is obliged reluctantly to admit that this method, along with others at present in use, has its limitations.

From the practical point of view the time which a faithful analysis takes, owing to the numerous cross currents, false scents, and mare's-nests, often makes it impracticable as a form of treatment. Whatever the theory as to ætiology adopted, and whatever the mode of treatment practised, it remains true that many, and perhaps the majority, of those suffering from functional nervous disorders get better, and, indeed, happily often lose their symptoms entirely. Many cases have also recovered without any pretence of treatment, or their cure has occurred during a treatment which has not perceptibly been causally connected with it. The repressive forces have perhaps become stronger, or the expanding or centrifugal force of that which is repressed has perhaps become weaker. Inquiry into the nature and strength of such forces is very much needed.

The fruits of experience and thought tend, above all things, to show that psychology is still in its infancy and that morbid psychology is younger still, that we cannot do much therapeutically, but that we can do something, and that we certainly cannot afford in examining a case to leave any stone unturned or in treatment to leave any method untried, whether it be derived from the physical or psychic worlds. To make too hard-and-fast a division between the psychic and the physical is to go unwarrantably beyond the data of experience. As physicians we have to deal with the mind and with the body, and where the sphere of the one begins and the other ends we certainly do not know, nor to what extent, for good or evil, they influence each other.

A CONTRIBUTION TO THE DIAGNOSIS OF ACTIVE PULMONARY TUBERCULOSIS.

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AT the recent Tuberculosis Conference in Leeds it was admitted by the pioneer of auto-inoculation therapy in England, Dr. M. Paterson, that "borderline" cases have been met with occasionally in his own practice. The excellent results at Frimley, however, can only be ascribed to the consummate care with which the patients were selected for graduated exercise, for certain it is that success depends very largely on prolonged rest, graduated if need be, coupled with close clinical observations, in all cases exhibiting signs of active disease in the chest.

This borderline type of patient may be described as follows:—

The temperature is normal when the patient is at rest in bed, and very frequently also on rising to have light exercise in the ward. The pulse-rate fluctuates between 80 and 90 per minute, and may not be more than 95 after dressing. Cough and sputum may or may not be present, and the physical signs in the chest may vary from an apical lesion of small dimensions to extensive disease involving both sides of the chest. The sputum, if present, may show no acid-fast bacilli, or these may be present in small or large numbers. If it be washed and plated, however, it will almost invariably be found to contain secondary invaders in varying numbers and kinds.

Pneumococci and streptococci are common, but staphylococci, *Micrococcus catarrhalis*, and other organisms are frequently observed. The patient himself has a feeling of comparative well-being, and may complain of nothing except the ennui of restricted freedom. He is apparently fit and well enough to take a step forward in treatment. The first step may be a successful one, but more frequently it is followed by a rise in temperature, accompanied by the symptoms of uncontrolled auto-inoculation. Much, if not most, of the damage caused by indiscriminate tuberculin therapy has been in this type of case.

Leucocyte Counts giving Quantitative and Qualitative Cell Picture.

With a view to establishing an objective proof of latent activity in this "borderland" type the author has carried out a large number of blood examinations, the details of which have been published elsewhere. I have found this helpful in guiding to a definite conclusion, one way or another, as to the suitability of a particular case for treatment by graduated rest and exercise.

The method is as follows:—

Total white cell counts are made at intervals during the day; blood examinations during the night are not necessary.

For practical purposes counts every three hours are sufficient. A note should be made of the temperature and pulse-rate on each occasion a total white cell count is made. The process should be repeated the following day if possible, and again at later dates until a definite conclusion is arrived at. Blood films are also taken at weekly intervals, the time, date, temperature, and pulse-rate being noted at the same time. A differential white cell count should be made, and finally an Arneth count of the nuclei of the polymorphonuclear leucocytes. A white cell picture is thus obtained. It is quantitative as well as qualitative.

From an analysis of 67 cases in which 150 differential counts of the white cells, together with Arneth counts, were made, and of 30 cases in which 250 total counts were estimated, the following conclusions were reached:—

1. If consecutive daily leucocyte counts are made, a variation in total numbers of white cells is found in all active cases of pulmonary tuberculosis—a variation in excess of that occurring normally in health. (See Leucocyte record A.)
2. Physical signs in the chest may give little or no help in determining the activity of a lesion. For instance, a cavity in the lung may be followed by pathological "repair" and clinical quiescence, and in such a case the total leucocyte count may be small, and the Arneth count but slightly altered. (See B.) Conversely, there may be a definite "leucocyte swing" and a marked "deviation to the left" in cases showing no other objective sign of active disease.
3. The total leucocyte count bears a definite relationship to the acuteness of the lesion in the chest, and the acuteness of the lesion has, in turn, a more or less intimate connexion with the presence of organisms other than the tubercle bacillus.
4. The Arneth "deviation to the left" (a phrase synonymous with an increase in cells of Class I. and II.—i.e., those with one or two nuclear segments) is established in all cases of active disease. The more severe the infection the greater is the deviation to the left. (See C.)
5. An approximation of the *quantitative and qualitative* blood picture to the normal is a favourable sign and indicates quiescence.

Significance of Total White Cell Count and its Fluctuations.

Examinations of the sputum and cultures from the lung tissue in all cases of advanced tuberculosis prove that organisms other than the tubercle bacillus play an important part in the bacteriology of the disease. (Ortner,[1] Petroff,[2] Ravenel and Irwin,[3] and others.) We know that, unlike the pneumococcus,[4] the toxins of the tubercle bacillus do not stimulate the production of polymorphonuclear cells. It is the rule to find leucopenia with relative lymphocytosis in early and also in advanced but quiescent cases of phthisis. Further clinical proof of the fact that the tubercle toxins do not encourage leucocytosis may be cited from the blood investigations in cases of miliary tuberculosis, where massive doses of tubercle toxin are constantly in the circulation. (See D, from Cabot.) All authorities agree that leucopenia is the rule in these cases. From two cases seen I am in a position to verify this statement. Treadgold's animal experiments are significant.[5]

It would appear, therefore, that the leucocytosis found in cases of active pulmonary tuberculosis is an indication of the "septic" element in the pathology of the disease, and it may be deduced that these "secondary" invaders give rise to hæmatological changes in the absence of other clinical signs of active disease in the lung.

To explain the low counts which interpolate themselves with such regularity and frequency in certain cases of pulmonary tuberculosis is difficult. They are not due to rest, nor can bone-marrow exhaustion explain them. Bone-marrow exhaustion, however, is not to be diagnosed from estimations of the total leucocyte count alone. The qualitative picture must also be considered. An apparently satisfactory quantitative reaction may be in reality a bad qualitative one, indicating failure of the bone-marrow. A third possible explanation of the "leucocyte swing" is that it is due to periodical intermissions from the diseased focus of substances acting on the polymorphonuclear cells by negative chemiotaxis.[6 7] The balance between the various toxins can never be equal, and in this way the leucocyte swing is maintained, being elevated when the "pyogenic" toxins are in excess, and being low when the blood stream is surcharged with tubercle toxin.

Significance of "Deviation to the Left" (Arneth).

The precise significance of the "deviation to the left" in the presence of an infection is problematical. This was dealt with in a note on "The Neutrophile Index" in THE LANCET of April 24th, 1920. I regard the excess of cells with one or two-lobed nuclei as due to an increased and excessive demand on the activities of the bone marrow. It is unfair to assume that the bone marrow can keep up a satisfactory response in quantity and quality over a long period of time, as in mixed pulmonary infection. Quality suffers before quantity, if we are to take the Arneth deviation to the left as a criterion of cellular efficiency; and from the large mass of work which has been done on the Arneth count, we are entitled to believe that the cells in Classes I. and II. are indicative of an ebbing immunity when they are in excess.

In the presence of a large number of "single-lobed" polymorphs such as is found in acute infection it is matter for surprise that myelocytes are not found much more frequently. Cells described as myelocytes have been found by Wack and Kast,[8] working independently. Personally I have never been able to identify true myelocytes in any of the films I have examined, not even in cases where the index has been over 95. It may be said, I think, that the deviation to the left is an expression of qualitative bone-marrow exhaustion, as distinct from quantitative. In miliary tuberculosis it has been shown that a leucocytosis is not a feature of the disease, and yet the Arneth count exhibits a deviation to the left as in most intoxications. (See E.) So also in intestinal diseases in children, it has been pointed out by Esser[9] that a similar phenomenon may be observed. I know of no observations which have been made on the neutrophile index in patients suffering from syphilis, whooping-cough, or typhoid fever, but until further observations are forthcoming in these diseases it can be suggested tentatively that aggressins, or the toxins associated with organisms which do not cause leucoplastic reaction, act on the bone marrow by inhibiting the development of the young polymorphic cell.

Some Illustrative Leucocyte Records.

A. On admission patient was pale and very much emaciated. At first the temperature was very unsteady, running between 98° and 100° F. The pulse-rate did not come below 90 per minute, despite evening temperature on Jan. 24th being normal. Several examinations of the sputum were made; on each occasion tubercle bacilli

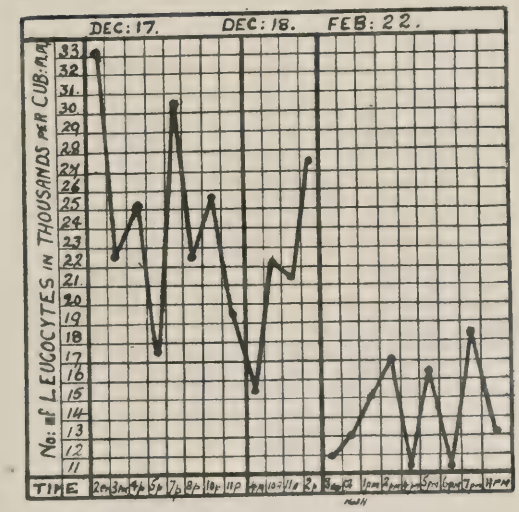

FIG. 1.—Leucocyte counts were made on Dec. 17th at 2, 3, 4, 5, 7, 8, 10, and 11 P.M.; on Dec. 18th at 4, 10, 11 A.M. and 2 P.M.; on Feb. 22nd at 8 A.M., noon, 1, 2, 4, 5, 6, 7, and 11 P.M.

were found. The physical signs in the chest showed impairment of resonance over right upper lobe with harsh breath sounds and numerous crepitations over the same area. On Feb. 29th the case closed dramatically. Hæmoptysis was so profuse that patient died five minutes after onset of bleeding. (Fig. 1.)

B. Patient was extremely emaciated. T. 99·4°-100·4° F. The sputum contained tubercle bacilli in large numbers—50 to 60 to the field.

Both sides of the chest, back and front, were dull to percussion. On auscultation, the respiratory murmur was very harsh over the entire chest, especially on left side, where whispering pectoriloquy could be heard. There were other definite signs of cavity formation over the upper lobe on left side. Numerous moist sounds accompanied both inspiration and expiration in both upper lobes. Arneth index, 71·5. (Fig. 2.)

C. Male, aged 24. Onset three months previous to date of first blood examination. Family history bad. General condition poor. Temperature 99° to 102° F. Pulse 100 to 110 per minute. Signs of acute disease in left lung and in upper lobe of right lung. Sputum contained tubercle bacilli, streptococci, staphylococci, and numerous diplococci. Patient died Dec. 24th.

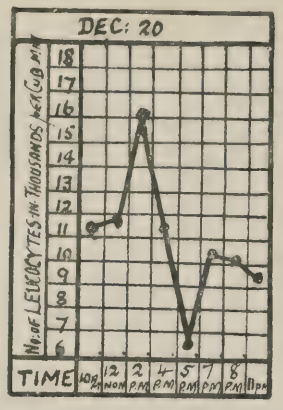

FIG. 2.—Leucocyte counts were made at 10 A.M., noon, 2, 4, 5, 7, 8, and 11 P.M.

Class ...	I.	II.	III.	IV.	V.	Index.	Date.
	42	46	12	0	0	94·0	Aug. 28th.
	47	45	8	0	0	96·0	Sept. 19th.
	48	45	7	0	0	96·5	Oct. 8th.

D. (*From Cabot.*)—*Miliary Tuberculosis.*

Date.	Time.	Leucocytes per c.mm.	Date.	Time.	Leucocytes per c.mm.
Dec. 22nd ...	10 A.M. ...	5625	Dec. 24th	8 A.M. ...	3750
	Noon. ...	4725		10.30 A.M. ...	3750
	3 P.M. ...	5000		2 P.M. ...	2500
	5 P.M. ...	3125		4 P.M. ...	2500

E. *Arneth Count from a Case of Miliary Tuberculosis.*

Class ...	I.	II.	III.	IV.	V.	Index.
	36	56	8	0	0	96

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BILHARZIA TREATED WITH TARTAR EMETIC.

BY F. G. CAWSTON, M.D. CANTAB.

THE study of a number of bilharzia patients who have undergone a course of treatment by intravenous injections of tartar emetic would appear to show that the best results are obtained where the injections are given on alternate days for most of the time, and the treatment is continued for a complete month. It has been my practice to commence with gr. ¼, and in only one case of idiosyncrasy have I noticed any severe effect from this initial dose. On that occasion the patient of 15 experienced great abdominal pain, vomiting, and collapse about four hours after the administration of the drug; this condition lasted till midnight. The second day I give half a grain, and on the third three-quarters. I then give, on alternate days, from one to one-and-a-half grains, and continue the injections for three to five weeks, according to the disappearance of ova from the urine. If the solution is absolutely fresh and the injections are given regularly, a total of from 12 to 15 gr. would seem to be sufficient to effect a permanent cure in the majority of cases.

Toxic effects are less common in patients who are given a solution of the drug which has not been freshly prepared, and it is reasonable to suppose that the drug loses much of its effectiveness if the solution is allowed to stand for even a short while after it has been made and boiled. There is also the danger of fungus-growth in solutions of tartar emetic. This presents the appearance of small flakes of cotton-wool, and is noticeable after the solution has been standing for only a few hours. The risk of injecting even small quantities of this into the general circulation can be avoided by dissolving the powdered tartar emetic by boiling in distilled water and injecting it before it has become cold. I find a solution of gr. 4 in 16 c.cm. of distilled water is a suitable preparation to give in all cases that have come under my care. This renders an ordinary hypodermic syringe a convenient one to use for the smaller doses.

There is an accumulative effect of tartar emetic which was well shown in a patient of mine whose skin under a wrist-watch was markedly blackened after receiving a total of 12 gr. of the drug. By giving the injections on alternate days we make good use of this accumulative action and make smaller doses more effective. As a rule, daily injections should be avoided, for the patient should be given time to recover from all toxic effects of the drug before receiving further injections. Toxic effects are undoubtedly lessened where the injections are given shortly after a light breakfast, instead of later on in the day. This point has been emphasised by Dr. J. B. Christopherson,[1] and is borne out by my own experience.

In the series of cases given in Table I. a comparatively small total dosage has proved sufficient, for in every instance the ova degenerated gradually until they disappeared completely, and the urine has remained free from blood for periods of from two to six months.

TABLE I.

—	Age.	Duration of disease.	Urine: + few ova, + + many ,,	Grs. of tartar emetic injected in No. of days.	Result in No. of days after injection.
C.C.	20	1 week.	+	5¾ (15)	No ova (145)
C.W.	12	1½ yrs.	+ +	13½ (34)	,, ,, (36)
H.R.	9	2 ,,	+ +	6½ (35)	,, ,, (120)
W.M.	29	7 ,,	+ +	12⅞ (25)	,, ,, (47)
O.S.	19	7 ,,	+	14 (30)	,, ,, (86)
A.S.	39	25 ,,	+	11 (20)	,, ,, (127)
H.B.	12	4 ,,	+ +	8½ (34)	,, ,, (198)
J.B.	10	4 ,,	+ +	8½ (35)	,, ,, (198)
D.C.	15	5 ,,	+ +	12¾ (27)	,, ,, (82)
L.D.	21	1 ,,	+	9½ (21)	,, ,, (41)
J.W.	16	3 ,,	+	11¼ (27)	,, ,, (169) (185)
S.C.*	28	15 ,,	+	10¼ (21)	Negative blood test (28)
C.R.	13	2 ,,	+ +	9½ (35)	No ova (37) 1 dead ovum (110)

* With positive blood test.

In the series of cases given in Table II. where the attendance of the patients was irregular or the course of injections stopped early for one cause or another, degenerated ova were found in the specimens of urine examined some weeks after the injections ceased.

TABLE II.

—	Age.	Duration of disease in years.	Ova in urine.	Grs. of tartar emetic injected in No. of days.	Remarks.
E.T.	16	5½	+ +	13½ (25)	Hæmaturia after 108 days. (Ova all apparently dead.)
H.W.	24	5½	+ +	12½ (24)	Two ova, one alive after 92 days.
J.C.	21	1½	+ +	10½ (21)	Hæmaturia after 177 days.
F.G.	16	4	+ +	11 (38)*	Many ova after 76 days. (Degenerated.)
B.T.	17	7	+ +	12½ (25)†	Living ova after 62 days.
F.McN.	15	5	+	12¼ (32)‡	Living ova after 73 days.

* Missed three days running. † Missed four days.
‡ Missed four days twice.

Two apparently dead ova were found in another patient's urine 277 days after treatment had ceased. He had received a total of 12¾ gr. in 40 days, besides some intramuscular injections of collosol antimonium. As he had suffered from hæmaturia daily for the previous 18 years and had seen no suggestion of it since his treatment, it is reasonable to suppose that he is cured of the disease. Another, whose treatment was discontinued at the end of only a fortnight on account of a severe "cold" following an injection in January last, reported a recurrence of his symptoms three months later. He had received a total of under 9 gr. of tartar emetic, and a full course of 15 gr. was given to make his cure complete.

Durban.

[1] Journal of Trop. Med. and Hyg., July 15th, 1919.

THE BLOOD AND URINE IN PANCREATIC DISEASE.

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I.

IT was shown by one of us in 1904[1] that when the urine of a patient suffering from an inflammatory affection of the pancreas is boiled with hydrochloric acid, the excess of acid neutralised, and a phenylhydrazin test carried out with the resulting liquid, a much larger yield of osazone crystals is obtained than with a normal urine treated in a similar manner. Later the test was modified, and its delicacy increased, by removing glycuronic acid from the boiled urine with subacetate of lead before heating with phenylhydrazin.[2] Subsequent experiments with dogs, conducted in conjunction with Mr. H. C. G. Semon, confirmed the results of clinical experience, and showed that an increased formation of osazone crystals after hydrolysis of the urine occurs when the functional activity of the pancreas is interfered with by operation.[3] An investigation of the crystals carried out at the same time proved that they had the characters of a pentosazone. In order to eliminate the personal factor as much as possible from the test and secure figures by which one case might be compared with another, and with the normal, a quantitative method was devised and described in 1913 under the name of the "Iodine Coefficient of the Urine."[4] This method had the advantage of being applicable to diabetic as well as to sugar-free urines, so that it was possible to investigate the functional activity of the pancreas in cases of glycosuria. A long series of observations showed that the iodine coefficient of healthy urine is nil, but that in cases of pancreatic disease it varies from 12 to 20 per cent., with a total of 100–200 units for the 24 hours. Meanwhile the nature of the pentose formed on hydrolysing pancreatic urines with an acid, and the composition of the mother substance from which it was derived, were being investigated, and in 1914 it was proved that the pentose has the characters of xylose and that the mother substance corresponds in chemical properties and composition to a dextrin.[5] Further research was interrupted by the war, but during the past year it has been resumed with results which we propose to discuss in this and subsequent papers. We shall there describe the investigations we have made into the origin of the urinary dextrin, and consider a series of new observations we were led to carry out on normal carbohydrate metabolism, and the changes occurring in diabetes mellitus, which we believe throw considerable light on the ætiology of that condition and furnish a basis for a more scientific treatment than has been possible hitherto.

The "Difference Value" of the Urine in Pancreatic Disease.

Before dealing with these subjects it will be convenient to refer to a comparatively simple process for estimating the dextrin content of the urine in cases of suspected pancreatic disease, which we have employed for some years in place of the so-called pancreatic reaction. It takes much less time to carry out than the iodine coefficient and, although not quite as accurate, gives comparable results, 3 units by the new method corresponding to 1 unit of the iodine coefficient; thus in cases of pancreatitis readings of 20 to 60 units per cent., with a total of 100 to 500 units for the 24 hours, are usually obtained. This method cannot be applied satisfactorily to urines containing more than a trace of sugar, and for such the more laborious iodine coefficient must be employed. A specimen of the urine is boiled with hydrochloric acid and, after the excess of acid has been neutralised, it is made faintly acid and liberated glycuronic acid removed by treatment with subacetate of lead. The fluid is then made up to a definite volume with water and filtered. The reducing power of an aliquot part of the clear filtrate is now determined by some delicate and accurate process, such as that described by one of us in 1917.[6] The reducing power of the filtrate from a sample of the unboiled urine, made faintly acid if necessary, treated with subacetate of lead, and diluted to a like degree, is also ascertained by the same method. The difference between the results, which we term the "difference value" of the urine, is a measure of the dextrin present. The details of the process are as follows:—

20 c.cm. of the urine are placed in a small flask and 2 c.cm. of hydrochloric acid (sp. gr. 1·165) are added. The neck of the flask is closed with a small funnel to act as a condenser, and the contents are boiled on a sand-bath for exactly 10 minutes. The excess of acid is then neutralised by adding 5 c.cm. of a saturated solution of sodium carbonate, slowly and with constant shaking, until frothing ceases. A dilute solution of acetic acid is now added drop by drop until there is no more effervescence and the fluid is faintly acid in reaction. The contents of the flask are transferred to a 50 c.cm. volumetric flask (A) and the flask in which the boiling has been carried out is washed out with a little water, the washings being added to the contents of the volumetric flask. The fluid is now well shaken with about 5 g. of subacetate of lead, made up to 50 c.cm. with water, mixed, and filtered. A control is prepared by mixing in a second volumetric flask (B) of the same capacity 20 c.cm. of unboiled urine, made faintly acid if necessary with a few drops of dilute acetic acid and about 5 g. of subacetate of lead. After being thoroughly shaken this is diluted to 50 c.cm. with water, mixed, and filtered. The reducing power of the hydrolysed (A) and the unhydrolysed (B) urine may be compared as follows: 3 c.cm. of a modified Benedict solution[7] and 1 c.cm. of a saturated solution of sodium carbonate are placed in each of two small flasks, provided with funnels in their necks to act as condensers, brought to the boil on a wire gauze and boiled for a few seconds to expel dissolved oxygen. Exactly 5 c.cm. of the filtrate from the flask A is added to one, and the same amount of the filtrate from flask B to the other. The boiling is then continued for exactly three minutes. At the end of that time 3 c.cm. of hydrochloric acid (sp. gr. 1·165) are cautiously run into each flask from a pipette, and the contents of the flasks are quickly poured into two larger flasks containing 100 c.cm. of previously boiled and cooled water, and 20 c.cm. of N/100 iodine solution, through thistle funnels drawn to jets which project below the surface of the iodine mixture. After washing out the boiling flasks with a few cubic centimetres of hot water, and adding the washings to the iodine solution, the larger flasks are thoroughly cooled and the excess of iodine in each is titrated with N/100 sodium thiosulphate solution, using a few drops of fresh starch solution as the indicator. The difference between the amounts of thiosulphate solution required to discharge the blue colour from the contents of the flasks, expressed in cubic centimetres and multiplied by 50, gives the percentage "difference value" of the urine.

The Difference Value of the Blood.

In attempting to trace out the source of the urinary dextrin in diseases of the pancreas attention was first turned to the blood. As it was obviously impossible to obtain sufficient material clinically from the peripheral circulation to isolate, or directly determine, a substance like dextrin, which has no very characteristic chemical properties, and would only be present in small quantities, a procedure similar to that employed for estimating the difference value of the urine was adopted. In our earlier experiments the reducing power of a protein-free filtrate from the blood before and after hydrolysis with hydrochloric acid was estimated by the method described by one of us in THE LANCET in 1917 and 1919, but later a modification of the Folin and Wu

[1] THE LANCET, March 19th, 1904, p. 782.
[2] Brit. Med. Jour., May 19th, 1906.
[3] Proc. Roy. Soc. B., vol. lxxxi., 1909, p. 372; Proc. Roy. Soc. of Med., iii., 4, February, 1910, p. 79.
[4] Seventeenth International Congress of Medicine, London, August, 1913, Med. Sect., p. 305; and Glycosuria and Allied Conditions, Ed. Arnold, 1913, p. 275.
[5] THE LANCET, Sept. 26th, 1914, p. 791.
[6] THE LANCET, April 21st, 1917, p. 613; and May 31st, 1919, p. 939.
[7] Dissolve 100 g. of anhydrous, or 200 g. of crystallised, sodium carbonate, 200 g. of sodium citrate, and 10 g. of sodium bicarbonate in about 600 c.cm. of distilled water by the aid of heat and add to it, with constant stirring, a solution consisting of 21 g. of crystallised copper sulphate dissolved in about 150 c.cm. of water. When the mixture has cooled to the room temperature make up to 1000 c.cm. with distilled water and filter.[6]

process[8] was adopted as a routine procedure, since it effected a considerable saving of time when a large number of analyses were being made, as was necessary in this series of investigations, in the course of which we have examined some 3000 specimens of blood. Experiment showed that the results were the same with both methods within the limit of experimental error, which proved to be about 0·002 per cent. in either direction in experienced hands. We found that the smallest amount of blood with which we could work satisfactorily was 0·3 c.cm., and this is the quantity we have usually employed in our work on the human subject, obtaining it from the root of the nail after congesting the finger by swinging and constricting it with a narrow rubber band.

The required quantity of blood (0·3 c.cm.) is measured in an accurately graduated narrow pipette and delivered into 4·5 c.cm. of water contained in a test-tube of hard glass. The contents of the tube are thoroughly mixed and allowed to stand for a few minutes; then 0·6 c.cm. of sodium tungstate solution (half the strength described by Folin and Wu[9]) and the same amount of 1/3 N. sulphuric acid, measured with a clean pipette, are added and the contents of the tube well mixed. It is now heated in a bath of boiling water for a few minutes to ensure complete coagulation of the protein, cooled, and the contents filtered. Two narrow test-tubes marked with a 12·5 c.cm. mark are next taken, and into one of them is introduced exactly 2 c.cm. of the clear filtrate and into the other 1 c.cm. of a 0·01 per cent. solution of pure dextrose and 1 c.cm. of distilled water to act as a standard. To each is added 1 c.cm. of Folin and Wu's alkaline copper solution, and the tubes are heated in a boiling water-bath for exactly six minutes. At the end of that time, without cooling, 0·5 c.cm. of an acid mixture containing sodium molybdate and sodium tungstate ("phenol reagent") is added to each. The tubes are gently shaken to dissolve the precipitate, cooled in running water, and 2·5 c.cm. of a saturated solution of sodium carbonate introduced. They are then made up to the 12·5 c.cm. mark with water and allowed to stand for 5 minutes. The depth of colour of the liquid in the tubes is then compared in a colorimeter, and from the results obtained the percentage of sugar in the blood is worked out. To obtain the hydrolysis value of the protein-free blood 2 c.cm. of the original filtrate are placed in a narrow test-tube with a 12·5 c.cm. mark and mixed with 0·5 c.cm. of hydrochloric acid, 2·5 per cent. The mixture is heated in a boiling water-bath for an hour, then cooled and neutralised by adding a saturated solution of sodium carbonate until effervescence ceases and the reaction of the liquid is faintly alkaline to litmus. The fluid is then treated in exactly the same way as described above for the estimation of the simple sugar. The hydrolysis sugar value given by the last estimation, less the value for the simple sugar obtained in the first determination, represents the "difference value" of the blood.

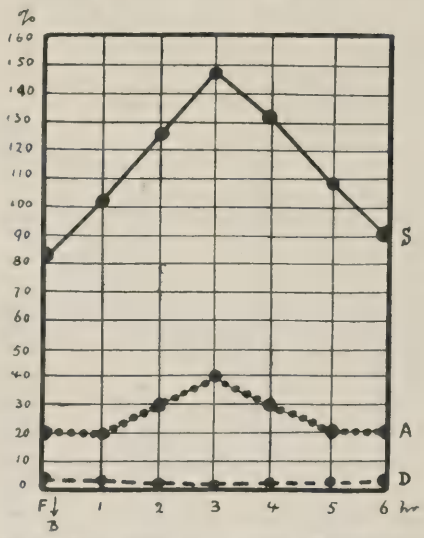


FIG. 1.—Normal blood taken at hourly intervals after a test-breakfast. S, Sugar per cent. × 1000; D, Difference value per cent. ×.1000; A, Amylolytic ferment per cent. × 10; F, Fasting values. B, Breakfast.

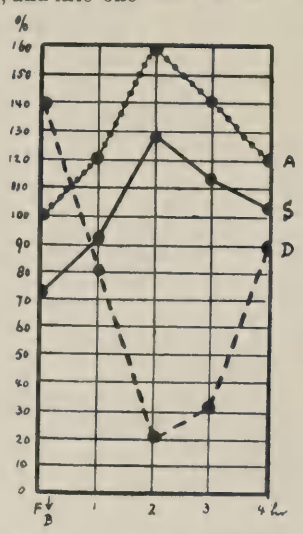


FIG. 2.—Blood from a case of chronic pancreatitis, with a gastric ulcer invading the pancreas, taken at hourly intervals after a test-breakfast. S, Sugar per cent. × 1000; D, Difference value per cent. × 1000; A, Amylolytic ferment per cent. × 10; F, Fasting values; B, Breakfast.

Observations on normal blood have shown that the difference value has a very limited range, varying from 0·002 to 0·008 per cent., and that it is not appreciably influenced by food or the nature of the diet. When examinations are made at hourly intervals after a meal a slight fall from the fasting level is usually seen at the end of the first and second hours, but by the third or fourth hour the value is again the same as when fasting or very little higher. In any case, the variation is so slight, not exceeding 0·006 per cent., as to be almost within the limit of experimental error, but the constancy of the change in a large number of observations is against this being the entire explanation. (Fig. 1.)

On carrying out a series of similar hourly examinations with blood from a case of pancreatic disease very different results are obtained. The fasting level is always considerably higher than normal, ranging from 0·050 to 0·150 per cent. in the cases coming under our observation. After a meal a rapid fall occurs for the first three hours, when, if no more food is taken, a return to the fasting level gradually follows, so that in six or seven hours the cycle is completed. On comparing the percentage of sugar in the blood with the difference value a striking relation is seen, for as the difference value falls after a meal the sugar rises the maximum of the latter corresponding to the minimum of the former, and with the succeeding rise in the difference value the percentage of sugar drops until the fasting relation is again reached. Thus, when the respective values are plotted out in a graph the sugar curve and the difference value curve move in opposite directions.

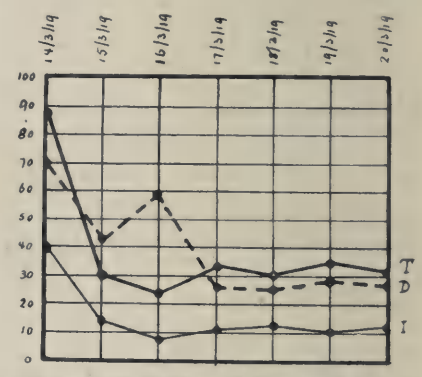


FIG. 3.—Daily readings of blood and urine from a case of chronic pancreatitis. D, Difference value of blood per cent. × 1000; I, Iodine coefficient of urine per cent. × 10; T, Total iodine coefficient of urine per 24 hours × 10.

(Fig. 2.) This relationship appears to be characteristic of a disturbance of the functions of the pancreas. The nature of the food taken seems to exert very little influence on the difference value curve or its relation to the sugar curve, a mixed diet, a meat meal, or a carbohydrate meal all giving very similar results. The only exception we have found is when the food consists entirely, or largely, of dextrinised starch, and in this case the difference value falls rather more slowly, and does not reach quite as low a level as when a mixed feed or an ordinary carbohydrate meal has been taken, suggesting that the difference value of the blood is then dependent to some extent upon the presence in the peripheral circulation of dextrins absorbed from the alimentary tract. But the fact that a protein-fat meal gives practically the same results as a meal of ordinary starchy foods is against the direct absorption of dextrins from the intestine being the usual explanation of the difference value of the blood.

It has been known for a considerable time that normal blood contains small quantities of a carbohydrate substance which yields a reducing body on boiling with a dilute acid. Freund obtained 0·82 g. of such a substance from 4 litres of ox blood, corresponding

[8] Practitioner, civ., 2, February, 1920, p. 114.
[9] Jour. Biol. Chem., xxxviii., 1, 1919, p. 81.

to 0·02 per cent. in 1892,[10] but no attempt appears to have been made, then or since, to investigate its source or significance, and with the exception of a few observations made by Lépine and Boulud in 1907,[11] the effects of disease, and particularly the influence of defective carbohydrate metabolism, on the amount present in the circulation do not seem to have been studied. Lépine and Boulud found that when the blood of a healthy dog was boiled with hydrofluoric acid its reducing power was increased by about 0·77 per cent., and that when the blood of a depancreatised animal was similarly treated a much larger increase occurred, a difference of 1·27 per cent, being met with in one instance. They accounted for the increase on hydrolysis by assuming the presence of a "sucre virtuel," but as they used whole blood for their experiments a considerable proportion of the "sucre virtuel" was no doubt reducing substances split off from the proteins of the blood by the action of the acid. Our experiments have been carried out with the protein-free filtrate, and the figures obtained represent therefore only the reducing power of the hydrolysable carbohydrate present in the peripheral circulation and are consequently much lower than those quoted by Lépine and Boulud. Our values for normal blood correspond more closely to the percentage for ox blood found by Freund than those given by the French observers, and tend to confirm the conclusion that a hydrolysable carbohydrate is a constant constituent of the blood. The fact that the percentage is enormously increased when the functional activity of the pancreas is interfered with by disease points to the amount of this substance in the circulation being controlled by some influence exerted by the gland on carbohydrate metabolism.

The Difference Value of the Blood and the Dextrin Content of the Urine.

In our earlier attempts to establish a relationship between the difference value of the blood and the dextrin content of the urine, as indicated by the iodine coefficient, we determined the former at a fixed time, usually three hours after breakfast, and compared it with the iodine coefficient of the collected 24 hours' urine for a number of consecutive days. Although the results when plotted out in a graph gave curves which were on the whole of a similar type (Fig. 3), the agreement was not sufficiently constant to warrant the inference that the one was related directly to the other, uninfluenced by any other factor. Later, when we had discovered the effects of the ingestion of food on the difference value of the blood, one reason for the occasional divergence of the curves became clear, and we therefore proceeded to compare the iodine values of the urine collected at hourly intervals, before and after a meal, with the difference values of samples of blood taken at similar intervals. On plotting out these results they were found to correspond very closely, suggesting that the dextrinuria of pancreatic disease is directly dependent upon the presence in the blood of a substance or substances, yielding a reducing body on hydrolysis with an acid, and therefore probably of similar composition. (Figs. 4 and 5.)

The Amylolytic Ferment of the Blood and Urine in Pancreatic Diseases.

Having found that the iodine coefficient of the urine is directly related to the difference value of the blood and that there is probably, therefore, an abnormal dextrin content in the blood in pancreatic disease, the next step was to determine the source of this dextrin. As dextrins are intermediate bodies formed during the conversion of starch, or glycogen, into sugar the most likely source of the dextrin was either absorbed products of digestion from the alimentary tract or converted glycogen, from the glycogen reservoirs of the body, which, owing to inefficient action of the pancreas, was not completely broken down to sugar, but passed into the blood stream at the soluble dextrin stage. As we have already seen, it is not likely that the difference value of the blood is directly dependent upon material coming from the alimentary tract, for, both normally and in pancreatic disease, its value is largely independent of the nature of the food; moreover, the fact that the difference value of the blood and the iodine coefficient of the urine are highest in the fasting state is strong evidence against such a conclusion. The glycogen stores of the body, and particularly the liver, seemed, therefore, to be the most likely source. It is well known

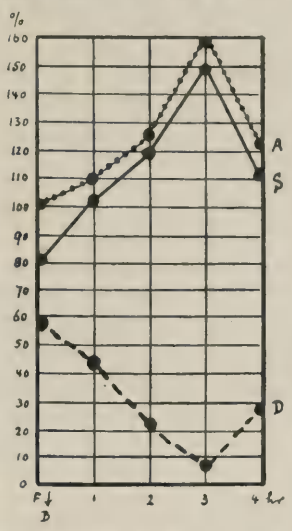


FIG. 4.—Blood from a case of cirrhosis of the pancreas, with defective fat digestion and intermittent glycosuria, taken at hourly intervals after a test-breakfast. S, Sugar per cent. × 1000; D, Difference value per cent. × 1000; A, Amylolytic ferment per cent. × 10; F, Fasting values; B, Breakfast.

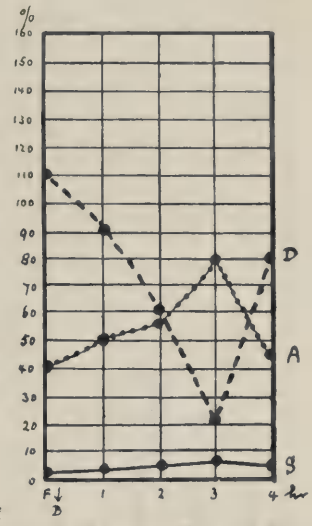


FIG. 5.—Urine from the same case as Fig. 4, taken at hourly intervals. T, Total iodine coefficient per hour × 10; A, Amylolytic ferment per hour × 10; S, Sugar per hour × 10; F, Fasting values; B, Breakfast.

that the amylolytic ferment of the urine is increased in diseases of the pancreas, and it occurred to us that if we could correlate the ferment contents of the blood and urine, with the difference value of the blood, and the iodine coefficient of the urine, it would tend to confirm the diagnostic value of the methods of examination we have described and probably give information bearing on the point in question.

For the estimation of the amylolytic ferment in the urine we employed the Wohlgemuth process, and for the blood devised the following method:—

0·2 c.cm. of blood is delivered into 2 c.cm. of water and thoroughly mixed. The protein is then precipitated by adding 0·4 c.cm. of Folin and Wu's sodium tungstate solution (half strength), and 0·4 c.cm. of N/3 sulphuric acid. The mixture is gently shaken, and without being heated is filtered. 1 c.cm. of the clear filtrate is then measured into each of two narrow test-tubes marked with a 12·5 c.cm. mark, containing 1 c.cm. of a 1/100 starch solution. One of the tubes is heated in a boiling-water bath for a few minutes to destroy the ferment and act as a control, and is then cooled. Both tubes are now placed in the incubator at 37° C., and left undisturbed for one hour. At the end of that time the sugar in each is estimated by the modified Folin and Wu process previously referred to in connexion with the determination of the difference value of the blood. The difference in the results, expressed in milligrammes of sugar, multiplied by 15, is taken as the amylolytic ferment index of the blood. If possible it is preferable to use a larger amount of blood for the estimation (e.g., 1 c.cm.), but with care satisfactory results may be obtained with the quantity mentioned. Experiment has shown that when 1 c.cm. of blood is employed the milligrammes of sugar, or when 0·2 c.cm. of blood is used the milligrammes multiplied by 15, correspond to units on the Wohlgemuth scale for urine.

With this method the amylolytic ferment of normal blood ranges between 2 and 5 units per cent., the lower figure being found in the fasting condition and the higher two or three hours after a meal. Simultaneous estimations of the amylolytic ferment and sugar in normal blood after feeding give curves of similar amplitude. (Fig. 1.) On examining the blood and urine from cases of pancreatic disease at hourly intervals it

[10] Centralbl. f. Physiol., 1892, vi., S. 345.
[11] Lépine: "Le Diabète Sucré," Paris, 1909, pp. 65, 345.

was found that the amylolytic ferment content of the two corresponded, and that when plotted out in a graph their curves moved with the percentage of sugar in the blood (Figs. 4 and 5) as in health, but at a much higher level. The difference value curve of the blood and the iodine coefficient curve of the urine, on the other hand, pursue an opposite course, the highest readings being obtained when the ferment and sugar are lowest, and vice versa. It would therefore appear that as the amylolytic ferment of the blood increases during digestion the sugar rises to a corresponding degree, but that the abnormal formation of dextrin-like bodies characteristic of the fasting state in disease of the pancreas is gradually checked. These results suggest that sugar and the substance on which the difference value of the blood depends have a common origin, and that the proportion between them varies with the amount of amylolytic ferment in the circulation. If the usually accepted view as to the cause of the rise in the blood sugar during digestion is correct, it would follow that the difference value is due to a substance of alimentary origin, a conclusion opposed to the available evidence. So far as we are aware there is no experimental proof, however, that the increase in the percentage of sugar in the blood after food has been taken is directly dependent upon material absorbed from the alimentary tract, and before proceeding further it seemed advisable to decide the question definitely if possible.

For this purpose, and also for the further investigation of other problems arising in the course of these researches, experiments upon animals under controlled conditions appeared to be necessary and were consequently undertaken.

Summary.

Our results up to the present point may be summarised as follows:—

1. The urine in disease of the pancreas contains an excess of dextrin, which can be measured by the iodine coefficient, and less accurately by the difference value of the urine.

2. The difference value of the blood in pancreatic disease varies directly with the iodine coefficient of the urine and is probably due to the same cause—namely, an abnormal dextrin content.

3. The difference value of the blood, and the iodine coefficient of the urine, are highest in the fasting state and gradually diminish after a meal for about three or four hours, returning to the fasting level after another three or four hours.

4. The difference value of the blood and the iodine coefficient of the urine vary inversely as the percentage of sugar in the blood after a meal.

5. The difference value of normal blood ranges from 0·002 per cent. to 0·008 per cent., and is not appreciably influenced by the ingestion of food.

6. The amylolytic ferment of the blood, and of the urine, is increased in disease of the pancreas proportional to the fasting difference value of the blood and the iodine coefficient of the urine.

7. The amylolytic ferment of the blood and urine in pancreatic disease varies directly with the percentage of sugar in the blood after a meal, and inversely as the difference value of the blood and the iodine coefficient of the urine.

II.—OBSERVATIONS ON THE BLOOD OF DEPANCREATISED ANIMALS.

In order to obtain more conclusive evidence, and to discover, if possible, the means by which the blood and urinary changes are brought about, we arranged a series of experiments upon animals. The operative portion of this work was conducted at the Physiological Institute of University College through the kindness of Professor E. H. Starling, and we take this opportunity of expressing our indebtedness to him for permission to make use of his laboratories for the purpose.

Normal Values.

Some of our experiments were carried out on dogs, others on rabbits, and the first step was to establish normal values for these animals, fasting, and after different test meals had been given. We do not propose to discuss here the influence of various foods on the normal sugar content, difference value, and ferment of the blood in detail as these will be dealt with more conveniently later; it is now only necessary that we should refer to certain fundamental facts which form the basis of the experiments to be described presently.

We found that in the fasting dog the sugar content of the blood averages about 0·09 per cent. After food has been taken the percentage of sugar in the blood gradually rises for some three hours to a maximum of about 0·14 per cent., and then gradually falls to the fasting level, which is reached in five or six hours after the meal. The fasting level in the rabbit is rather more variable than in the dog, ranging from about 0·084 per cent. to 0·086 per cent. in small rabbits, up to 0·094 per cent. to 0·096 per cent. in large "Belgian hares." The effect of feeding is much the same in rabbits as in dogs, a gradual rise in the percentage of sugar in the blood taking place for about three hours, and being followed by a fall to the fasting level during the succeeding three or four hours. As a rule, the maximum figure attained is about 0·16 per cent. The difference value of the blood in both rabbits and dogs is much the same as in man, ranging from 0·002 per cent. to 0·008 per cent. As in the human subject it is not appreciably influenced by feeding. The amylolytic ferment in normal animals is lowest in the fasting condition, averaging about 2 per cent. in both dogs and rabbits. After a meal there is a gradual rise to about 4 per cent. in dogs and 5 per cent. in rabbits in three or four hours, followed by a fall to the fasting level some three or four hours later. Thus, as will be seen from the diagrams (Figs. 6 and 7), the blood sugar curve and the amylolytic ferment curve move in the

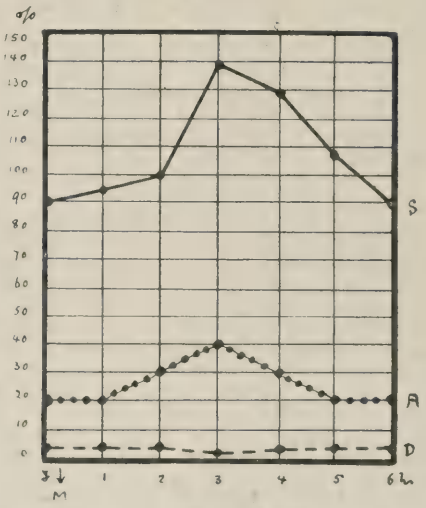


FIG. 6.—Normal dog, meat diet. S, sugar per cent. × 1000; A, Amylolytic ferment per cent. × 10; D, Difference value per cent. × 1000; F, Fasting values; M, Meal.

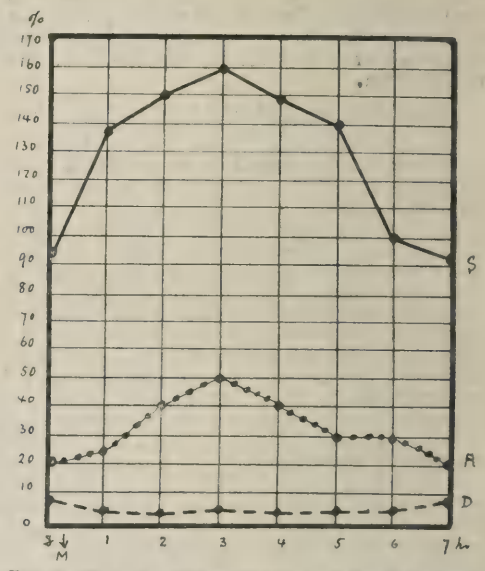


FIG. 7.—Normal rabbit, mixed diet. S, Sugar per cent. × 1000; A, Amylolytic ferment × 10; D, Difference value per cent. × 1000; F, Fasting values; M, Meal.

same direction after food, while there is a slight tendency for the difference value curve to follow an opposite course.

The Effects of Pancreatectomy in the Dog.

The influence exerted by the pancreas on the blood and urine of the dog was investigated by observing the effects of removing one-third, two-thirds, and practically the whole gland from three animals. All of them recovered satisfactorily from the operation; the wound healed well, and the animals were apparently in good health a week afterwards, when a series of blood analyses were commenced. For each series the dog was fasted for 18 to 24 hours, a sample of the fasting blood was taken for analysis, and it was then given a test-meal. An hour afterwards 3 c.cm. of blood were drawn from a vein in the ear, and similar specimens were subsequently taken at hourly intervals for five or six hours without any further food being given. Estimations of the sugar content and of the difference value were then made with 2 c.cm. of each sample by the methods previously described, and the remaining 1 c.cm. was used to determine the amylolytic ferment. At the end of the experiment the dog was placed in a metabolic cage, and the urine passed during the 24 hours following the test-meal was collected. This was measured and the total excretion of sugar and the iodine coefficient were worked out.

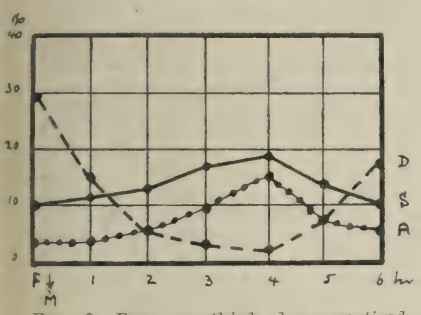


FIG. 8.—Dog, one-third depancreatised, mixed diet. S, Sugar per cent. × 1000; A, Amylolytic ferment per cent. × 10; D, Difference value per cent. × 1000; F, Fasting values; M, Meal.

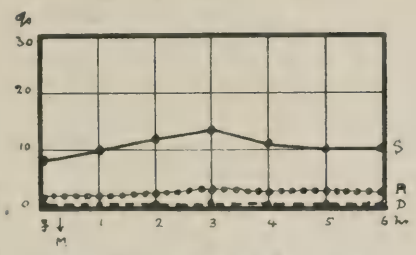


FIG. 9.—Normal dog, mixed diet. S, Sugar per cent. × 1000; A, Amylolytic ferment per cent. × 10; D, Difference value per cent. × 1000; F, Fasting values; M, meal.

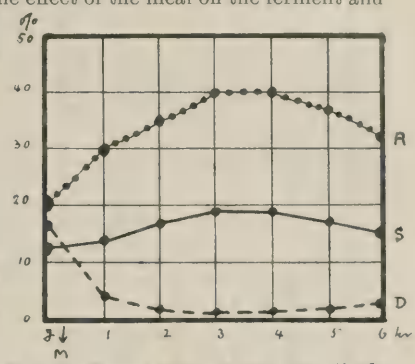


FIG. 10.—Dog, two-thirds depancreatised, mixed diet. S, Sugar per cent. × 1000; A, Amylolytic ferment per cent. × 10; D, Difference value per cent. × 1000; F, Fasting values; M, Meal.

Removal of one-third of the pancreas.—About one-third (2·7 g.) of the tail end of the pancreas was removed from the first dog. One week after the operation examination of the blood, taken fasting, showed 0·12 per cent. of sugar, a difference value of 0·38 per cent. and an amylolytic ferment of 5 per cent., compared with 0·09 per cent. sugar, a difference value of 0·004 per cent., and an amylolytic ferment of 2 per cent. under the same conditions before the operation. The removal of even a third of the pancreas had thus caused an enormous increase in the difference value, with only a slight rise in the sugar and amylolytic ferment. That this change was not dependent upon the immediate effects of surgical interference with the contents of the abdomen, but resulted from the removal of a portion of the pancreas, is shown by the fact that five weeks later a sample of blood taken after a 24 hours' fast contained 0·10 per cent. of sugar, gave a difference value of 0·30 per cent., and showed an amylolytic ferment of 7 per cent.

The effect of a mixed diet containing about 120 g. of carbohydrate, including 1 ounce of marmalade, was then investigated, with the results shown in Table I.:—

TABLE I.

—	Fasting	—	1 hr.	2 hrs.	3 hrs.	4 hrs.	5 hrs.	6 hrs.
Sugar per cent..	0·100	Mixed meal.	0·110	0·130	0·170	0·190	0·140	0·100
Hydrolysis value per cent. ...	0·400		0·260	0·200	0·200	0·200	0·200	0·280
Difference value per cent. ...	0·300		0·150	0·070	0·030	0·010	0·060	0·180
Amylolytic ferment per cent.	7		7	13	17	30	12	10

The relation of these figures is seen in the chart. (Fig. 8.) For comparison the results obtained with a normal dog on the same diet, drawn to the same scale, are also shown. (Fig. 9.)

Removal of two-thirds of the pancreas.—The dog on which this operation was performed had normal fasting values of 0·09 per cent. for sugar, 2 per cent. for the amylolytic ferment, and a 0·006 per cent. difference value. Three weeks after the operation, at which two-thirds (10 g.) of the body and tail of the pancreas were removed, these values had risen to 0·13 per cent. for the sugar, 20 per cent. for the ferment, and 0·170 per cent. for the difference value. There was thus a slightly higher sugar, a marked increase in the ferment, and a considerably lower difference value than in the dog from which only one-third of the gland had been removed when specimens of blood were examined under the same conditions. After a mixed meal of similar composition to that given to the first dog the sugar content of the blood began to rise more quickly, but the maximum level attained was only slightly higher, and the return to the fasting level took longer. The effect of the meal on the ferment and difference values of the blood was much more striking, the former rising more quickly and to a much higher level than in the dog from which one-third of the pancreas had been removed, and the latter falling more rapidly until almost a normal value was found at the third hour; the subsequent rise in the difference value was also much slower. The figures obtained in this experiment were as shown in Table II.:—

TABLE II.

—	Fasting	—	1 hr.	2 hrs.	3 hrs.	4 hrs.	5 hrs.	6 hrs.
Sugar per cent.	0·130	Mixed meal.	0·140	0·170	0·190	0·190	0·176	0·150
Hydrolysis value per cent. ...	0·300		0·180	0·190	0·200	0·200	0·190	0·180
Difference value per cent. ...	0·170		0·040	0·020	0·010	0·010	0·014	0·030
Amylolytic ferment per cent.	20		30	35	40	40	37	32

These results are represented graphically in the chart. (Fig. 10.) In the 24 hours following the test diet the one-third depancreatised dog passed 300 c.cm. of urine containing 0·3 per cent. of sugar and with an iodine coefficient of 20 per cent., giving total excretions of 0·9 g. of sugar and 60 iodine coefficient units. The two-thirds depancreatised dog excreted 500 c.cm. of urine containing 0·7 per cent. of sugar and with an iodine coefficient of 10 per cent., working out at 3·5 g. of sugar and 50 iodine coefficient units for the 24 hours. The dog from which the larger proportion of the pancreas had been removed therefore passed more sugar, but less dextrin, in the same space of time when they were on similar diets, results corresponding to the higher level of the sugar curve and the lower difference values obtained with the blood.

TABLE III.

—	Fasting	—	1 hr.	2 hrs.	3 hrs.	4 hrs.	5 hrs.
Sugar per cent.	0·190	Mixed meal.	0·210	0·240	0·300	0·500	0·400
Hydrolysis value per cent.	0·200		0·210	0·240	0·300	0·500	0·400
Difference value per cent.	0·010		0·000	0·000	0·000	0·000	0·000
Amylolytic ferment per cent.	50		60	65	70	85	75

Total pancreatectomy.—Practically the whole of the pancreas (17·5 g.) was removed from this dog at one operation. It made a good recovery, and, although losing weight and passing typical fatty stools, remained lively and free from complications until death from diabetic coma, experimentally induced, occurred a fortnight later. Careful dissection post mortem showed only 0·2 g. of pancreatic

tissue remaining. Three days after the operation the fasting blood was found to contain 0·19 per cent. of sugar, with an amylolytic ferment of 50 per cent. and a difference value of 0·010 per cent. A mixed meal, of the same composition as that given to the other two dogs, next day brought about the changes in the blood values shown in Table III.

In graphic form these results are represented, on the same scale as for the other two dogs, in the chart. (Fig. 11.) It will be seen that total removal of the pancreas induced a much higher level of sugar in the blood, both fasting and after the test meal, than in either of the other two animals. The output of sugar in the urine was correspondingly increased, specimens obtained by catheter showing 8 per cent. two hours after the meal and 11 per cent. at the fourth hour. There was also a very marked rise in the amylolytic ferment. The difference value, on the other hand, was much lower in the fasting state and was reduced to zero by the end of the first hour. At the end of the fifth hour, when the last analysis was made, it was still absent.

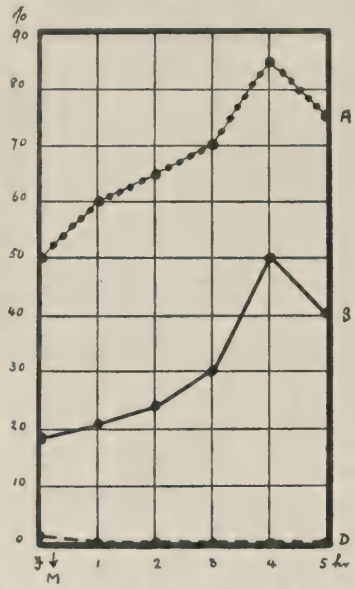


FIG. 11.—Dog, totally depancreatised, mixed diet. S, Sugar per cent. × 1000; A, Amylolytic ferment per cent. × 10; D, Difference value per cent. × 1000; F, Fasting values; M, meal.

Discussion of the Results.

The results of these experiments on animals confirm the conclusions based upon clinical observation previously described. They show that the difference value of the blood varies inversely with the percentages of sugar and amylolytic ferment, both fasting and after a meal. They also show that the difference value of the blood and the iodine coefficient of the urine are related to the functional activity of the pancreas. When this is interfered with the difference value rises to abnormal heights, the increase being greatest in the fasting condition and in the earlier stages of pancreatic insufficiency. After a meal, and as the functions of the pancreas are less efficiently performed, the difference value of the blood diminishes again, so that when practically the whole of the gland is removed, with consequent very pronounced hyperglycæmia and glycosuria, the difference value drops to almost the normal level during fasting and disappears entirely for some hours after a meal. It would seem, therefore, that an increase in the difference value of the blood and in the iodine coefficient of the urine above normal values indicates an early stage of defective carbohydrate metabolism due to interference with the functions of the pancreas, but that as the defect increases and frank hyperglycæmia and glycosuria develop the difference value and iodine coefficient fall to a corresponding degree—that is to say, an abnormal increase in the difference value of the blood or in the iodine coefficient of the urine is a sign of a prediabetic condition dependent upon a defect in the functional activity of the pancreas. A similar conclusion was arrived at by one of us on clinical grounds in 1913, when the history of a case of chronic pancreatitis, which eventually became diabetic, was described.[12] It was then shown that the iodine coefficient in the urine increased as the disease progressed, until glycosuria developed, when it gradually fell as the excretion of sugar became larger.

The fact that the difference value and the sugar content of the blood move regularly in opposite directions, both after a meal and as the functional capacity of the pancreas diminishes, points to their having a common origin and being controlled by the same influences. One controlling influence which determines their relation appears to be the functional activity of the pancreas, and although the increase in the difference value in the earlier stages of pancreatitis, or when a small portion of the gland is removed, with the subsequent fall which occurs as the cirrhotic changes in the gland advance, or more of the organ is removed, might suggest that the substance in the blood on which the difference value depends is derived from the pancreas itself, this would not explain the relation of the difference value to the sugar or account for the rapid fall during digestion. Further, it does not seem likely that the dextrin-like bodies giving rise to the iodine coefficient in the urine, and probably the difference value of the blood, would be set free in the circulation in sufficient amount to explain the results obtained.

The simplest explanation of the difference value of the blood, and the iodine coefficient of the urine, would be the presence in the peripheral circulation of dialysable dextrins absorbed from the alimentary tract, and that this may be a partial cause under certain circumstances is shown by the effect of feeding a depancreatised dog on a diet of dextrinised oatmeal. On comparing the chart (Fig. 12) representing the blood changes after a meal of dextrinised oatmeal in a dog from which two-thirds of the pancreas had been removed with the chart from the same dog after a mixed meal (Fig. 8), it will be seen that, although the sugar curves are much the same in amplitude, the difference value curve after the oatmeal is slower in falling, and does not reach the same low level as when a mixed meal was taken, suggesting that more hydrolysable carbohydrate was passing into the peripheral circulation in the former case than in the latter. When, however, the same experiments were tried with a totally depancreatised dog similar difference value curves were obtained with dextrinised oatmeal and with a mixed feed. This, with the fact that a meal of meat only (Fig. 13) gave the same difference value curve as a mixed meal containing carbohydrate in all the dogs, points to the comparatively slight variation following dextrinised oatmeal in the one-third and two-thirds depancreatised dogs being only a partial and exceptional cause of the difference value in the blood and not the usual explanation.

A study of the portal and peripheral blood taken from rabbits after fasting for 24 hours, three hours after a meal of dry oatmeal and three hours after being fed on dextrinised oatmeal, offers an explanation of the variations in the results obtained with these foods, and incidentally shows that a considerable proportion of a thoroughly cooked starchy food is absorbed into the portal blood in the form of dextrins and maltose, whereas an uncooked starch is almost completely broken down to dextrose before it appears in the portal vein. One set of experiments gave the results shown in Table IV.:—

TABLE IV.

—	Marginal vein.			Mesenteric vein.		
	Fasting.	Dry oats.	Dext. oatml.	Fasting.	Dry oats.	Dext. oatml.
Sugar per cent. ...	0·090	0·150	0·156	0·094	0·240	0·300
Hydrolysis value per cent.	0·092	0·154	0·160	0·096	0·250	0·500
Difference value per cent.	0·002	0·004	0·004	0·002	0·010	0·200

From these figures it will be seen that, while the difference value of the mesenteric blood is increased five times after a meal of dry oats, it is increased a hundredfold by a feed of dextrinised oatmeal, whereas the sugar value is only increased about two and a half times and three times respectively, suggesting that a large proportion of the dextrinised food is absorbed into the portal circulation in a hydrolysable form and not as dextrose. Actual analysis of the mixed blood from one set of rabbits taken after a feed with dry oats and of another set after a meal of dextrinised oatmeal confirmed these conclusions, for the proportion of dextrose

[12] XVII. Int. Cong. of Med., London, August, 1913, Med. Sect., p. 305.

in the latter was found to be considerably less than the proportion of dextrose in the former, while the percentages of dextrin and maltose were much increased, especially the dextrin, as shown by the figures in Table V.

TABLE V.—*Analysis of Portal Blood.*

—	Dextrose per cent.	Dextrin per cent.	Maltose per cent.
Dry oats	96	1·6	2·4
Dextrinised oatmeal	60	25·0	15·0

Most of the dextrose and nearly all the hydrolysable carbohydrate are apparently stopped in the liver, however, for on comparing the figures given by the blood from the marginal vein it will be seen that the percentage of sugar is practically the same after both dry oats and dextrinised oatmeal, and that it is only increased above the fasting value about one and a half times against two and a half times and three times in the mesenteric blood for dry oats and dextrinised oatmeal respectively. A still larger proportion of the hydrolysable carbohydrate appears to be retained in the liver, for the difference value of the blood from the marginal vein was only doubled after both feeds, though mesenteric blood taken at the same time showed a hundredfold increase in the difference value after the dextrinised food. It is therefore evident that as long as the liver is functioning normally the ingestion and absorption of dextrinised starches exert comparatively little influence on the difference value of the peripheral blood. Another argument in support of this conclusion is that the highest difference value in depancreatised dogs is found in the fasting condition, the reverse of what one would expect if it were directly dependent upon carbohydrate material absorbed from the alimentary tract.

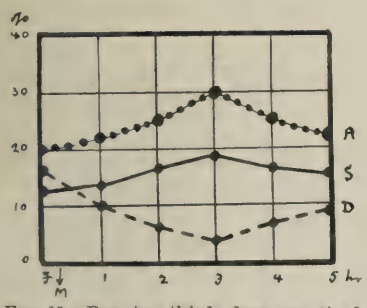


FIG. 12.—Dog, two-thirds depancreatised, dextrinised oatmeal diet. S, Sugar per cent. × 1000; A, Amylolytic ferment per cent. × 10; D, Difference value per cent. × 1000; F, Fasting values; M, Meal.

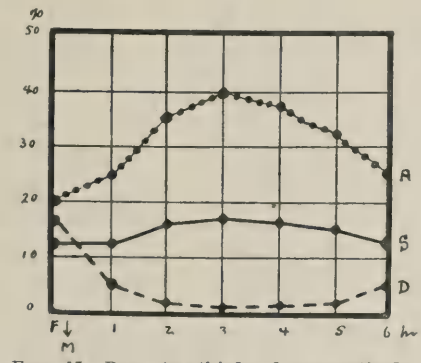


FIG. 13.—Dog, two-thirds depancreatised, meat diet. S, Sugar per cent. × 1000; A, Amylolytic ferment per cent. × 10; D, Difference value per cent. × 1000; F, Fasting values; M, Meal.

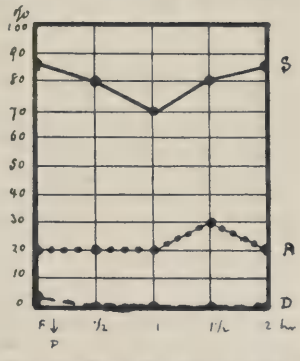


FIG. 14.—Normal rabbit, pancreas extract intravenously. S, Sugar per cent. × 1000; A, Amylolytic ferment per cent. × 10; D, Difference value per cent. × 1000; F, Fasting values; P, Pancreas extract injected.

By a process of exclusion we are driven to the conclusion that the difference value of the peripheral blood arises from the presence of a hydrolysable carbohydrate, or carbohydrates, derived from the glycogen stores of the body, and of these the liver, being the largest, and as we have seen the situation in which such material coming from the intestine is held up, is probably the most important. The question which then arises is, What is the relation existing between the pancreas and liver, and why does the removal of a portion of the pancreas increase the difference value of the blood, whereas total pancreatectomy reduces it?

Injection of an Extract of the Pancreas.

Before discussing the possible answers to these questions, which might be based upon the effects of diminishing the physiological influence of the pancreas by excising portions of the gland, it is advisable that we should consider the results produced by the opposite procedure—namely, increasing it by injecting a fresh extract of the pancreas.

The pancreas of a fasting rabbit was removed as completely as possible immediately after death, cut up finely, and half of it ground in a mortar with 10 c.cm. of Locke's solution and sand. The resulting emulsion was then centrifugalised and 2 c.cm. of the clear supernatant liquid were injected into the marginal vein of another fasting rabbit after a sample of blood had been taken for analysis. Subsequently specimens of blood were taken at half-hourly intervals for two hours and analysed with the results shown in Table VI.

TABLE VI.

—	Fasting	—	½ hr.	1 hr.	1½ hrs	2 hrs.
Sugar per cent.	0·086	Injection 2 c.cm. pancreatic ext.	0·080	0·070	0·080	0·086
Hydrolysis value per cent.	0·090		0·080	0·070	0·080	0·086
Difference value per cent.	0·004		0·000	0·000	0·000	0·000
Amylolytic ferment per cent.	2·0		2·0	2·0	3·0	2·0

The injection gave rise to no apparent discomfort, and was not associated with any lowering of temperature or signs of shock, but the sugar content of the blood was depressed below the fasting level, and at the end of an hour stood at a figure far below any we have ever met with in a normal rabbit. Within half an hour of the injection the normal fasting difference value of 0·004 per cent. had disappeared, and it had not returned when the experiment was concluded. These effects are well seen in the chart. (Fig. 14.)

In order to exclude the influence of injected proteins and to demonstrate the dependence of the changes observed on ferment action we carried out a control experiment with another portion of the same extract which had been boiled and cooled previous to injection. This was found to have no effect on either the sugar or difference value of the blood, which remained at the fasting levels.

Taking these results in conjunction with the blood changes following pancreatectomy it seems probable that the pancreas exerts an inhibitory action on glycolysis, regulating the breaking down of stored carbohydrate into sugar and intermediate products by means of a ferment which is destroyed by heat. When the influence of the pancreas is completely removed, as in total pancreatectomy, stored and ingested carbohydrate is converted entirely into sugar by the uncontrolled activity of the glycolytic ferment of the tissues, with resulting marked hyperglycæmia and a normal or sub-normal difference value in the blood; when the functions of the gland are only partly interfered with, as in partial pancreatectomy, the first stage in the breaking down of glycogen is still abnormally active, so that an excess of the intermediate products of glycolysis, in the shape of dextrins, pass into the circulation, but the restraining influence of the pancreas is now sufficient to prevent further conversion to sugar, consequently the difference value of the blood rises, but the percentage of sugar is not appreciably affected; when, as in the injection experiments just described, the controlling influence of the pancreas is increased, on the other hand, the opposite effect to pancreatectomy is produced, the normal conversion of glycogen into simpler forms of carbohydrate which goes on even in the fasting condition being interfered with, so that dextrins disappear from the blood and the normal percentage of sugar is diminished.

The Amylolytic Ferment of the Blood.

We have previously pointed out that the amylolytic ferment content of the blood varies in pancreatic disease in the human subject directly with the percentage of sugar and inversely as the difference value. A study of the effects of pancreatectomy in dogs shows that this relation holds good under experimental conditions also. The figures and charts given in the second part of this paper demonstrate that as a larger proportion of the pancreas is removed, and the percentage of sugar in the blood rises, the percentage of amylolytic ferment increases correspondingly. Thus in a normal dog, when fasting, the amylolytic ferment of the blood averages about 2 per cent., when one-third of the pancreas had been removed we found 7 per cent., after the removal of two-thirds of the gland it had risen to 20 per cent., and in a dog from which the whole of the pancreas had been removed a fasting level of 50 per cent. was obtained. The corresponding sugar values of the blood rose from 0·09 per cent. for the normal dog to 0·10 per cent. for the one-third depancreatised animal, then to 0·13 per cent. for the two-thirds pancreatectomy, and finally to 0·19 per cent. after total pancreatectomy. The difference value, on the other hand, after an initial rise from 0·002 per cent., or thereabout, for the normal dog to 0·300 per cent. after the removal of one-third of the pancreas, fell to 0·170 per cent. when two-thirds of the gland were excised, and then to 0·010 per cent. after the whole organ had been removed. Such a constant and intimate relation between these values suggests that the percentage of sugar and the difference value of the blood are dependent upon the amount of amylolytic ferment. As long as the amylolytic ferment ranges within normal values the percentage of sugar does not exceed the normal limit of 0·15 per cent. and the difference value varies between 0·002 and 0·008 per cent., but when the amylolytic ferment rises to abnormal heights the breaking down of stored carbohydrate is accentuated. In the early stages, while the amylolytic ferment is only moderately increased, the intermediate products of glycolysis (dextrins) appear in the blood in abnormal amounts, but when the amylolytic ferment rises still higher these intermediate products are further broken down and the percentage of sugar steadily rises as they diminish, until finally all carbohydrate passing into the circulation does so in the form of dextrose. A relationship of the same type is seen in normal animals after a meal, and still better in one from which a small portion of the pancreas has been removed, for, as will be seen from the charts (Figs. 6, 7, 8, 9), the amylolytic ferment rises after food has been taken and with this rise there is a corresponding increase in the percentage of sugar and a fall in the difference value.

As the pancreas is the gland from which the amylolytic ferment required for the digestion of starches in the alimentary tract is chiefly derived it is tempting to assume, as has generally been done, that the amylolytic ferment of the blood and urine is also of pancreatic origin, but the evidence of our experiments is opposed to such an inference, for it is inconceivable that the ferment should appear in increasing amount as the organ from which it is supposed to be derived is diminished in size and that it should be at a maximum when the whole gland has been excised. There must therefore be some other origin for the amylolytic ferment of the blood, and the liver seems the most likely source. Since the days of Claude Bernard it has been known that the liver possesses glycolytic powers and that if the liver of an animal is kept at body temperature after death the contained glycogen quickly disappears and is replaced by sugar. The rapidity of this transformation after death and its comparative slowness during life have never been satisfactorily explained. Our experiments seem to offer a solution, and this lies in the antagonism between the internal secretion of the pancreas and the amylolytic ferment of the liver, the latter inducing glycolysis and the former restraining it: in other words, the internal secretion of the pancreas functions as a brake on the glycolytic activities of the liver ferment.

Perfusion of the surviving liver.—To test the validity of this view in another way we proceeded to carry out experiments with the "surviving" livers of rabbits, perfusing one series with Locke's solution, and another with a similar solution containing an extract of fresh pancreas prepared as in the previously described injection experiments.

The fluid flowing from a cannula in the superior vena cava was collected in each experiment for periods of 15 minutes at a time for 75 minutes. The total sugar and difference value for each period were worked out and, after the glycogen remaining in the liver had been determined at the end of the experiment, the percentage of glycogen, sugar, and difference value for each 15 minutes were calculated. The average result of three perfusions with the plain Locke's solution are shown in the diagram (Fig. 15) by light lines and the results of perfusion with Locke's solution containing fresh pancreatic extract are indicated by heavy lines.

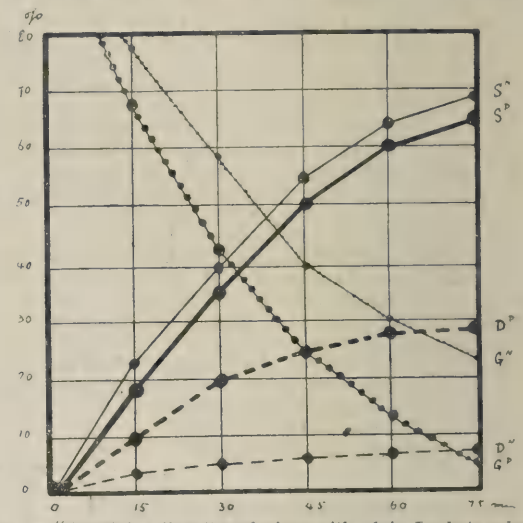


FIG. 15.—"Surviving liver" perfusions with plain Locke's solution (light lines) and with added pancreatic extract (heavy lines). Normal averages: Sn, Sugar per cent.; Dn, Difference value per cent.; Gn, Glycogen per cent. Pancreas extract: Sp, Sugar per cent.; Dp, Difference value per cent.; Gp, Glycogen per cent.

It will be seen that the addition of an extract of pancreas to the perfusion fluid caused an appreciable reduction in the amount of glycogen broken down. The output of sugar was diminished, but the difference value was considerably increased. These experiments with the surviving liver, therefore, lend support to the view that the pancreas exerts a restraining influence on the glycolytic ferment of the liver, interfering with the breaking down of glycogen and causing a relative increase in the production of the intermediate hydrolysable derivatives, with a diminution in the normal end-product, reducing sugar. As the perfused extract was prepared from the whole pancreas, and consequently contained the zymogen of the external as well as the internal secretion of the gland, the possible effect of the former must be taken into account, and it may be that its presence accounts to some extent for the very considerable increase in the difference value.

Summary.

The animal experiments described confirm the conclusions arrived at on clinical grounds. In addition they show that:—

(1) The rise in the difference value of the blood resulting from interference with the functions of the pancreas insufficient to produce frank hyperglycæmia and glycosuria, diminishes as the volume of the gland is further reduced and the percentage of sugar in the blood and the excretion of sugar in the urine rise.

(2) The hydrolysable substance in the blood on which the difference value depends appears to be derived chiefly from the glycogen stores of the liver, and is an intermediate soluble product (dextrin) formed in the conversion of glycogen to sugar.

(3) The liver contains an amylolytic ferment which passes into the blood and urine, and it is as a result of its activity that the glycogen of the liver is broken down.

(4) The pancreas exerts a restraining influence on the glycolytic ferment of the liver, probably through its internal secretion.

(5) Normally, the balance between the glycolytic ferment of the liver and the internal secretion of the pancreas is maintained in such a way as to keep the

percentage of sugar, and the difference value of the blood, within well-defined limits; when this balance is interfered with abnormal relations result.

(6) A relative increase in the pancreatic secretion causes a fall in the percentage of sugar and in the difference value of the blood.

(7) A relative diminution in the secretion of the pancreas, with consequent greater liberty of action on the part of the glycolytic ferment of the liver, gives rise in the early stages to an increased formation of the intermediate products of glycogen degradation without any change in the sugar, and in the later stages to an increasing sugar production with a proportional diminution in the intermediate products.

(8) The appearance in the blood and urine of intermediate products of carbohydrate metabolism, as shown by the difference value of the blood and the iodine coefficient of the urine, indicates a prediabetic condition which, if allowed to progress unchecked, will be followed by hyperglycæmia and glycosuria.

(9) Incidentally it has been shown that a considerable proportion of a well-boiled starch is absorbed into the portal circulation in the form of dextrins and maltose, whereas an uncooked starch enters the portal blood chiefly as dextrose.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

THE ANTIDIURETIC EFFECT OF PITUITARY EXTRACT IN DIABETES INSIPIDUS.

BY MAURICE DAVIDSON, M.A., M.D. OXON., M.R.C.P. LOND.,
PHYSICIAN TO OUT-PATIENTS, ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN.

IN April, 1919, there appeared in the *Quarterly Journal of Medicine* an interesting account of some observations by Drs. E. L. Kennaway and J. C. Mottram upon the antidiuretic effects of pituitary extract in diabetes insipidus with a detailed account of two cases. In view of the comparative rarity of this condition I now record the following notes of a case recently under my care in which injections of pituitrin were given, and observations made upon the total output of urine in the 24 hours, as well as notes on the amount and specific gravity of the samples collected at frequent intervals after the injections. The injections were always followed by an action of the bowels, and on the first occasion by vomiting, but except for this no untoward effects were observed. Apart from the discomfort and annoyance of the symptoms the patient suffered no inconvenience beyond that of a slight bronchitis, which yielded to treatment. There were no symptoms or signs to suggest any associated disorder of the pituitary gland.

The patient, an ex-soldier, aged 35, was admitted to the wards of the Miller General Hospital on May 21st, 1920. He gave the following history. He had always been a healthy man until he was invalided from the Salonika front in the winter of 1917 with bronchitis and nephritis (*sic*). He was sent back to England, and while in hospital at Malta, en route, he began to complain of polyuria for the first time. He was treated for bronchitis and asthma, but no special attention was paid to the other condition.

On admission to the Miller Hospital his condition was as follows:—He was a healthy looking well-developed man. He complained of some cough and of great thirst, and continual polyuria. On examination he had signs of some bronchitis; medium rhonchi were audible all over both lungs without moist sounds; there was a moderate amount of expectoration. He was treated for this with belladonna and stramonium, and the physical signs in the chest cleared up. The heart was normal. There was no sign of œdema of the face or legs, nor was there any albuminuria. His visual fields were not diminished; the appearance of the fundus oculi on both sides was normal. A skiagram of the skull showed no abnormality of the sella turcica. From the time of his admission he suffered continually from intense thirst, and was allowed as much water as he wanted day and night. The urine was pale, acid in reaction, of low specific gravity (1000), and contained no sugar or albumin. The amount passed per 24 hours averaged just over 300 oz.

It was decided to administer hypodermic injections of pituitary extract in order to observe its effect upon the diuresis, and to see whether after continuing the injections for some time any permanent or lasting effect was obtained. The results are shown in Table I. It will be seen from this table that the antidiuretic effect of the pituitrin was such as to cause an appreciable diminution in the total excretion of urine in the 24 hours. The effect was much more pronounced during the period shortly following the injections as may be seen from the record of the hourly collection of

TABLE I.—*Quantity of Fluid Taken and Urine Passed.*

Days after admission on 21/5/20.	Pints of fluid taken per 24 hrs.	Ounces of urine passed per 24 hrs.	Days after admission on 21/5/20.	Pints of fluid taken per 24 hrs.	Ounces of urine passed per 24 hrs.
1	28	238	14	23	348
2	23	313	15	25	400
3	24·5	320	16	23	390
4	20	312	17	24	350
5	26	309	18	23	410
6 (See Table II.)	6*	340	19	22	350
7	18	54	20	20	326
8	17	145	21	22	328
9	18	140	22	20	288
10	15	155	23	22	294
11	21	252	24	22	304
12	24	244	25	24	320
13	22	278	26	21	304

* Evening measure of intake not recorded.

From the sixth to the twelfth days injections of pituitrin were given daily as shown in Table II.

Body-weight on fourth day 9 st. 9 lb., on eleventh day 9 st. 7½ lb., on nineteenth day 9 st. 6 lb., on 26th day 9 st. 3½ lb.

TABLE II.—*Hourly Record of Urine after Injection.*

Date in 1920.	*Injections of pituitrin* and urine collected.	Specific gravity.	Date in 1920.	*Injections of pituitrin* and urine collected.	Specific gravity.
27/5	*1 c.cm. at 7 p.m.*		30/5	*1 c.cm. at 6.30 p.m.*	
	8 P.M. ... 12 oz.	1000		9.30 P.M. ... 3 oz.	1015
	9 P.M. ... 6 oz.	1007	31/5	*0·5 c.cm. at 11.30 a.m.*	1005
	10 P.M. ... 2 oz.	—		*0·5 c.cm. at 11.10 p.m.*	1010
28/5	6 A.M. ... 16 oz.	1010	1/6	12.10 A.M. ... 24 oz.	1000
	1 c.cm. at 7 p.m.			5.30 A.M. ... 20 oz.	1005
	8 P.M. ... 3 oz.	—		*1 c.cm. at 9 p.m.*	
	11 P.M. ... 4 oz.	1018		10 P.M. ... 8 oz.	1000
29/5	6.30 A.M. ... 15 oz.	1015	2/6	6 A.M. ... 10 oz.	1005
	1 c.cm. at 12.15 p.m.			*1 c.cm. at 11.45 p.m.*	
	12.30 P.M. ... 24 oz.	1000		12 mdn. ... 10 oz.	1000
	1.15 P.M. ... 3 oz.	1000	3/6	6 A.M. ... 12 oz.	1015
	6 P.M. ... 24 oz.	1008			
	8 P.M. ... 2 oz.	1010			

specimens of urine. (Table II.) After June 3rd (thirteenth day after admission) several doses of pituitrin were given by the mouth, but without any appreciable effect upon the amount of urine secreted. The polyuria continued, the man's general condition being satisfactory and the bronchitis and asthma having completely cleared up. He was discharged from hospital in order to go for a short time into a convalescent home.

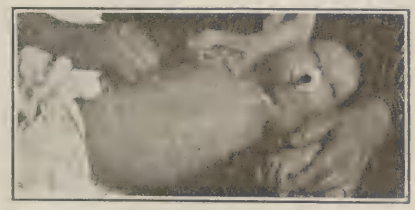
Wimpole-street, W.

AN INFANT AMAZON

BY D. S. PRACY, L.R.C.P. LOND., M.R.C.S. ENG.

COMPLETE absence of the breast in a female infant appears to be a very rare occurrence, and the following case may therefore be worthy of record.

Mrs. K., multipara, was delivered on March 25th, 1920, of a full-term, healthy female child, of 9 lb. weight. On examination of the infant I found that there was complete absence of the left breast and nipple, and absence of the major part of the anterior axillary wall, due to absence of the costo-sternal portion of the great pectoral muscle.



The accompanying illustration shows the child at the age of 6 weeks.

Atherstone.

Medical Societies.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

Annual Meeting.

AT the seventy-ninth annual meeting of the Medico-Psychological Association, held at the Mental Hospital, Cheddleton, and at the Town Hall, Buxton, Dr. BEDFORD PIERCE, the retiring President, was in the chair. There was a large muster of members, and an unusual feature was the excellent concert given in the recreation hall of the Mental Hospital by the orchestra, of which Dr. W. F. Menzies is conductor.

The Minimal Requirements for a Small Clinical Laboratory.

Dr. W. G. THOMSON read a paper on this subject, in which he discussed the best way to set about providing the apparatus needed for routine investigations on nerve tissue, blood, cerebro-spinal fluid, and excreta, and for clinical tests in institutions at which there is no whole-time expert pathologist. The minimal cost of such equipment he estimated at £115.

Dr. TOM WILLIAMS (Washington, D.C.) spoke of the method carried out in America for centralising the laboratory and teaching work of a number of asylums in the same State; and said that members of the asylum staffs periodically attended these centres.

Dr. J. MIDDLEMASS spoke of the great benefit of being able to conduct routine examinations at one's own hospital. Simple examinations of the cortex of the brain, in his own experience, had cleared up many obscure cases. Every asylum would be the better for some such equipment as Dr. Thomson had indicated.

Lieutenant-Colonel E. W. WHITE proposed that the cordial thanks of the Association be tendered to Dr. Bedford Pierce, the retiring President, and also to the other officers for their services.—Dr. J. B. SPENCE seconded, remarking specially on the work of the Registrar (Dr. A. Miller), and the secretary (Dr. R. Worth).—Dr. BEDFORD PIERCE replied.

The PRESIDENT, in introducing Dr. W. F. Menzies, superintendent of the Mental Hospital, Cheddleton, as President for the coming year, extolled his thoughtful work in the specialty, and his many services for the Association.

Presidential Address: The Mechanism of Involutionary Melancholia.

Dr. MENZIES then gave an exhaustive address on this subject. He said that at the present time, when the claims of psychogenic treatment were attracting even the lay mind, it befitted those who believed that beneath every mental process there was a mechanical basis to ask themselves whether they were quite blameless if easily understood psychological explanations were substituted for the much more intricate and complex physiological ones. Had alienists always applied to the problems of nervous physics all the available knowledge? Twenty years ago Crookshank endeavoured to correlate physical signs with mental conditions, and 15 years later Dunlop Robertson drew attention to the importance of adrenalin in the production of depression. Those engaged in this specialty should be willing to apply to it the simpler tests of the physiologist and the chemist. The type of illness he had chosen for this address comprised two distinct processes, and his aim was, by tracing the conditions present in both, to offer some explanations as to the proximate causes underlying: (1) involution, and (2) depression. The psychology of melancholia was the depressive emotion; the anatomy of the depressive emotion was a sympatheticotonus, and the chemistry of the latter was an endogenous anoxæmia. Dr. Menzies expressed his indebtedness for clinical and laboratory observations to Dr. W. D. Wilkins and Dr. W. G. Thomson. At the involutionary period a most important factor was excessive intestinal putrefaction. This needed consideration, for though constipation and dementia were common in old age, only a few old people were depressed. Intestinal stasis was certainly very common among the insane, and bands and fine adhesions were evident when looked for; and he reminded the meeting of the theory of Sir William Arbuthnot Lane as to the causation of these. Yet in young neurotic persons it was sometimes possible to make out an undue breadth of colon, unequal dilatation of stomach, with exaggerated flexion at the angular notch, and tonic contraction of one or other rectus muscle, though a daily emptying of the bowel took place. Keith believed that enterostasis was due to nodal segments, and Dr. Menzies thought that both Keith and Lane might be right. He then entered on a lengthy consideration of the various digestive products elaborated in the intestine and of the views generally held about them. To understand the connexion between bacterial absorption and melancholia it was essential to have an anatomical basis to work upon, and that basis existed in the involuntary nervous system; its importance could not be over-estimated. In regard to the physiology of the emotions, it had long been recognised that fear could cause certain superficial presentations, but only comparatively recently had systematic efforts been made to trace the technique, especially by Pavlow, Hornberg, Müller, and Bickel. The next step was to show that the inhibition caused by the emotional impulses was closely connected with the activity of the involuntary nervous system. Bayliss and Starling proved that all the phenomena of digestion in the mouth, stomach, and duodenum could be stimulated if an acid fluid were applied to the duodenal mucous membrane after the nerves had been divided, showing that another important factor was at work in body processes; this factor was named the action of hormones. The sympathetic system could generally overcome the autonomic, but did not persist so long. Cannon considered that the autonomic system quietly built up the body reserves against a time of stress, its operations having but little effect on the tone. Many phenomena produced by emotion and by the nervous outflow from the involuntary system were closely duplicated by the effects of adrenalin, as Oliver and Schäfer showed in 1894. Dr. Menzies proceeded to recount the physiological properties which had been observed to follow the giving of adrenal extract, from which it was clear that an emotional outflow was at one with the sympatheticotonus and was accompanied by an increase of adrenalin acting as a hormone. It had long been known that severe emotion produced diabetes, and a large number of observers noted that glycosuria was common in melancholia, the amount of sugar in the urine varying with the degree of depression. Glycosuria was easily produced in excited cats, and it was often found in football players and in some of the spectators. A better indication, however, was derived from an estimation of the blood sugar. In melancholia alone was glycæmia unduly high before meals.

Dr. Menzies next considered the conduction of nerve impulses before they reached the cerebral cortex and the possible paths by which those subserving feeling-tone might travel. Head's brilliant conceptions of the nature of sensation had added a new chapter to the science of neurology, and these he discussed fully. Ramsey Hunt had enunciated the theory that two distinct systems of motor fibres to skeletal muscles exist—(1) the paleokinetic, to the sarcoplasmic substance, associated with slow tonic contraction; (2) the neokinetic, to the sarcostyles, associated with the quick, spasmodic, "voluntary" contraction. Hunt held that the principle was carried right through from the periphery to the centre, and was also represented in the cerebellum, and clinical evidence was adduced from the observed differences between the two forms of muscular hypertonus. The matter could not, however, yet be regarded as settled. Dr. Menzies then discussed the various paths separately, and proceeded to consider the question of thalamic sensations. Head codified the nature of thalamic sensations and showed that partial interruption of the thalamocortical path had a profound influence in releasing sensations registered in the thalamus from the inhibitory effects

of cortical activity. Normally, all sensations reaching the thalamus were subjected to minute analysis in the cortex and allowed or censored after judgment had been passed. But in certain diseased conditions either the connecting path was impaired, or the cerebral cortex was unfit to function, and then the sensation rose to the dignity of an emotion, which could be regarded as a temporary flood in a stream of feeling-tones. All feeling-tones did not eventuate in emotion, nor were all defensive emotions tornadoes; they might develop slowly, and last for weeks, even months, and such a condition constituted depression. In melancholia there appeared to be a chronic hyperadrenalism. He went on to review the signs present in states of depression, and considered next the exaltive emotion. The thalamus was the centre which presided alike over the depressive and exaltive feeling-tones and emotions.

After considering the functions of the cerebral cortex, the Betz cells, the layers of the cortex, the pre-Rolandic cortex, the post-Rolandic cortex, Dr. Menzies proceeded to consider the cortex in disease, remarking that our chief knowledge of the course followed by the cerebro-spinal fluid had been gained by observing the process of brain atrophy, and the distribution of the areas of wasting in dementia. It was plain, he said, that involutionary processes were independent of the mental state which might accompany them, though both, in some cases, might be dependent on the same causes. Involution was a march of gradually increasing cytolysis, and appreciably depended upon the power of reaction of the hepatic antitoxins to the intestinal toxins, the penalty of failure being defective oxidation. What was known as melancholia depended on modifications of the same processes, especially on excessive bacterial fermentation and enterostasis. Alienists were now, apparently, on the way to a better understanding of the problems underlying the origin of the psychoses. Science waited upon the chemist, who, in turn, waited upon the clinician; cases must be observed with a more scientific eye. At the present time more kudos was to be gained from selling a sow than from sensitising a serum, from taking twopence off the maintenance rate than from discovering how dysentery was propagated. The man of science had ever been the Cinderella of the profession, and the beggarly salary of a head clerk was supposed to be sufficient for a brilliant pathologist. But there was now a dawn on the horizon; the war had cast over the art of medicine a new spirit, and the brilliant results attained in preventive fields by organised research had proved that money so spent was a good investment to the nation. The Board of Control had commenced a campaign, so that it was hoped that before many years each mental hospital would have its triad of trained observers—pathologist, biochemist, clinician. In conclusion, Dr. Menzies said he had suggested a few problems which he hoped might raise curiosity and criticism.

Some Determinants of Morbid Emotionalism.

On Wednesday morning, at the Town Hall, Buxton, with the President in the chair, Dr. WILLIAMS gave a contribution on this subject. He said emotility was, until the present century, dealt with in a purely introspective and observational manner. It was difficult to understand how there could be reactivity without that state of feeling which was known as emotility; even a unicellular organism, which had no differentiated nervous system, must have a state of feeling at the moment of being repelled by a stimulus. And on passing up the animal scale we could observe the difference between the manifestation of a state of feeling or emotion and the more purely purposive manifestations which were regarded as associated with the cerebro-spinal nervous system. An emotion was the function of the whole organism. The individual who was not emotive was morbid, abnormal. He went on to explain the states which he regarded as indicating morbid emotility, from the ordinary "blues" of a temporary character to more serious states, especially the "phobiacs," who had met with a series of circumstances which they had been unable to transcend. In these cases the emotion did not cease as soon as its determinant ceased. He described his process of re-education aimed at the cure of the condition.

The Value of Psychoanalytic Teaching.

There were then submitted to the meeting three contributions on psychoanalysis. The first was by Dr. W. H. B. STODDART and was entitled "A Brief Résumé of Freud's Psychology." He considered Freud the greatest psychologist who had ever lived. An unpleasant memory was not thrown away into space, but could be revived by such processes as hypnotism and psychoanalysis. The driving of unpleasant thoughts deeper into the mind was known as "repression," an automatic mechanism to protect the individual from intolerable thoughts. A constellation of repressed ideas was known as a "complex" and inhabited the unconscious mind. But a desire which had been banished from the conscious was constantly striving for recognition and gratification. As the conscious would not allow this, such gratification must be achieved in a distorted guise; it was sublimated in various activities. If the patient did not remain normal he gratified his complexes by the creation of symptoms. Neuroses, psychoses, and dreams were fundamentally the same, the only difference being that the neurotic or psychotic lived his dream. Freud held that forgotten infantile desires and interests remained permanent throughout life, and that many adult activities owed their energy to primitive infantile impulses; any neurotic or psychotic manifestation among members of his own family, especially the father or mother, had a profound effect on the mental development of the child. With regard to the sexual problems Freud did not really extend the meaning of the word sexual to include the young child; he merely recognised certain infantile activities to be of a sexual nature, because they would be regarded as sexual by everybody if they occurred in an adult. Freud would be the first to admit that such activities were quite innocent in a child. Opposition to this belief was largely due to the topic of sex being taboo. Sexual indulgence was regarded as a crime except in wedlock. Sexual topics were far more banned than those of theft, murder, and other crimes. Yet engagements and marriages were of great interest to the very people who banned intimately sexual topics. The outcome of this banning was found in certain data regarding the sexual perversions — homosexuality, masochism, sadism, fetishism, masturbation. An enormous number of people were homosexual without knowing it. Probably Freud was right when he said nobody was quite normal sexually; hence repression achieved the force of an inborn instinct. Professor Clifford Allbutt, in his recent presidential address at Cambridge, expressed his thankfulness that it did not fall to his lot to seek for pearls in that sty, and although the professor prepared a public criticism of the method he did not even take the trouble to learn anything about it. Dr. Stoddart hoped members of this association would not be led from the path of scientific investigation by sentimental objections based on their own psychic make-up. He proceeded to point out that in psychoanalysis the analyser said nothing; he only encouraged the patient to unfold his own story.

Homosexuality.

Dr. C. STANFORD READ read a paper on Homosexuality. The revolt of the moral sense against the idea of homosexuality was attributed by Freud in great part to the existence in the ordinary mind of a homosexual component of the sex instinct, which found indirect expression in the condemnation of homosexuality in others. But man was not the purely reasoning individual he believed himself to be: he was largely swayed by unconscious emotional forces which warped his thought and action. A study of the perversion was necessary to the mental physician for an understanding of the human problems with which he had to deal. He hoped the present wider study of Freudism would arouse a discontent with the old more or less purely descriptive psychiatry. Homosexuality in its conscious form, when it was carried into overt action, was far more prevalent than was usually supposed. It was needful to differentiate the passive from the active

form; the first was a developmental abnormality, the latter was acquired in the course of mental growth, and must be considered as a neurosis. He proceeded to elaborate the Freudian doctrine, pointing out the connexion between paranoia and latent homosexuality, and showing that psychoanalysis would explain the delusions of persecution, jealousy, erotomania, and grandeur seen in paranoia. Alcohol tended to destroy sublimation and aid regression, and thus might set free early trends, of which homosexuality was found to be a common one. He concluded with an appeal for a careful and unprejudiced study of Freud's contentions, which had been arrived at by long research and observation.

Sadism and Masochism.

Dr. REES-THOMAS read a contribution on this subject. He said that in sadism was included everything from an impetuous attitude towards the sexual object to the stage in which sexual gratification ultimately depended upon the complete subjugation and ill-treatment of the sexual victim. Masochism, on the other hand, ranged from mere subjugation to the sexual object to the suffering of physical or mental pain as a condition of sexual pleasure. This paper treated of these in their broad meaning. Bloch referred to these conditions as affecting mankind in the mass, as shown by gladiatorial combats, revolutions, marriage by capture, cannibalism, &c. He spoke of the relationship of muscular exertion to sexual excitement, and of intensity of feeling causing an overflow to other impulses, and thought this might be a factor in the later formation of sadistic impulses. He quoted illuminating instances, from his own experience, of the truth of Freud's contentions. He contended that the step from the psychic state of the normal lover to that of the sadist was but a short one. Usually sadism and masochism were found side by side in the same individual. Active and passive cruelty must be recognised as almost universal, and it acted, in greater or less degree, in influencing and colouring the sexual abnormalities and psychoses.

Psychoanalysis and the Psychoses.

Dr. H. G. BAYNES (Zurich) sent a contribution with this title, which was read by Dr. BEDFORD PIERCE. The author said that in dementia præcox there was a certain toxic element, but the "complex" was the principal causative factor, and many psychotic cases had been cured by analysis. Professor Jung had told him of cure of cases seven years ago by this method, and there had been no relapse in the meantime. The right attitude to take in respect to these conditions was, "Is this condition due to some trauma or lesion producing a secondary disturbance, or is it a disturbance of function producing corresponding changes of anatomical structure?" This brought the greater responsibility of inquiring as to what was the primary cause of the disturbance in function; it brought one into contact with the individual moral problem. Clinical medicine could not be an exact science because it assumed man to be a constant factor. He referred to the derisive condemnation with which the medical world had treated the attempts of Freud and Jung to examine psychical disorders from the subjective and individual standpoint. He pointed out the respects in which Jung was unable to accompany Freud all the way, and quoted that authority's explanation of the unwillingness of the patient to forsake the pleasant world of his phantasy for the actual world of experience. The subjective comprehension of the psychotic state entailed upon the analyst a constant exercise of deep and sympathetic accord instead of that of the detached observer, so that he was able to enter the patient's unreal world with him. There was no essential difference between the phantasy-world of the insane and the dream-world of the normal person.

Criticism of Present-day Psychoanalysis.

Dr. WILLIAM BROWN contributed some criticisms of present-day psychoanalysis. He agreed there was in the profession a widespread lack of understanding of psychoanalysis, and this was well exemplified in the recent Cambridge meeting of the British Medical Association. Remarks were there made concerning it which those who understood the process knew to be both untrue and unfair. Since 1912 he had endeavoured to test the various facts and theories which Freud and Jung had put forward. He had tried to analyse his own dreams, and had submitted himself to analysis, and he had been surprised at the way in which unconscious trends of thought sprang to the surface. He did not agree with Freud that everyone found life tremendously hard; a healthy man with a clean ancestry did not find it so. He agreed with Hughlings Jackson that the more one studied one's dreams the better would one understand psychology; but that did not mean that the normal waking life must be regarded as an outgrowth, a something superposed upon dreamlike activities. As early as 1892 Freud showed that when certain hysterical patients brought up lost memories an emotion was aroused which, having been worked off, left the patient much better; it was termed the method of "abreaction." Two groups of hysteria were determined on: retention hysteria and defence hysteria. Bryer, who went far with Freud, parted company from him on the degree to which he drew upon sex as a causative factor in these conditions, and it was at this parting that psychoanalysis was born. He gave some experiences in the cure of loss of memory and other mental symptoms by analysis during the war. Complete cure was brought about by abreaction and psychocatharsis. An important matter was giving the patient an opportunity of working off the emotion of fear which he had not the opportunity of doing while he was in the line, where soldiers were more or less in a state of stupor. Freud stated that emotions could not be remembered, but Dr. Brown could not agree with that. He quoted cases in which obviously childish emotions were lived over again in military patients. The chief difference between Freud and Bryer was on the libido content: Freud's view was getting nearer and nearer to the physical, while Bryer's was emotional. He (the speaker) thought psychoanalysis should be carried out as far as possible and as fully as possible. He believed that even in psychoanalysis where the examiner refrained from leading the patient on by his own remarks, the influence of suggestion, though unconscious, was present and potent. Sex tendencies, sadism, masochism were present in some cases, but he (the speaker) denied them anything like the universality claimed by Freud's disciples.

Discussion.

Sir ROBERT ARMSTRONG-JONES declared his belief that Freudism was dead in England to-day. When that system first came to light he regarded it as probably applicable to life on the Austrian and German frontiers, but not to virile, sport-loving, open-air people like the British. Psychoanalysis was thought to be a splendid thing because it brought baser desires to the surface and enabled them to be discussed; but he reminded the meeting that all the courtesies and conventions of decent society were founded on intelligent repression. These restraints were rather ridiculed by the new psychiatrists. He believed suggestion played a large part in psychoanalysis. The method was claimed as the thing for the educationalist, for spiritual development, for social welfare and social regeneration; he was astounded at the variety of the claims, which had not yet been substantiated. He proceeded to discuss the regional anatomy of the brain, the use of terms, and the mechanism of psychic determinism.

Professor GEORGE ROBERTSON, speaking as an asylum physician, insisted on the great distinction between a true, manifest psychosis and a psychoneurosis, though the two might coalesce in the same person. The importance arose as to the applicability of psychoanalysis, for to psychoneuroses psychotherapeutic treatment—such as psychoanalysis—was very suitable, while it was not at all beneficial to true psychoses, the subject of which could not be convinced that he had an abnormal mind; he regarded such an idea as nonsense. Professor Robertson also emphasised the fact that these early cases of psychoneurosis were not early cases of insanity, and did not tend to pass into insanity. He went on to discuss toxæmias and dream-states, and in regard to Freudism said that anyone who studied Freud on dreams and tried to analyse his own dream-states could not fail to be convinced of the truth of

Freud's contentions. He referred to a number of very instructive cases in support of his views.

Dr. BEDFORD PIERCE dwelt upon the view that because a thought or tendency was repressed it was bound to appear in some other way in the person; he thought the mistake made was in regarding them necessarily as realities, as comparable to water, which if pushed out of one place would come up in another. He did not think mental processes should be so considered; why should they not rather be considered as mental gunpowder? Gunpowder could remain unexploded for all time.

Dr. F. H. EDWARDS suggested that some synthetic process must follow the analytical, and asked why dreams were always symbolic. He did not believe early emotions could be revived, but only the memory of them, sometimes with a resumption of childish speech.

Dr. R. G. M. LADELL agreed that on first becoming acquainted with Freudism it seemed repulsive, but on proceeding to study it and on submitting oneself to analysis one was forced to the conclusion that Freud was justified in his contention that these tendencies did exist. Children were admittedly innocent, and that was the reason they were "indecent"; the indecencies of childhood were natural. Hypnotism was helpful in many cases of neurosis, but in others it was necessary to proceed much further and do psychoanalysis. He preferred to treat each case on its individual merits. He had been dealing with war cases in a pensions hospital, and some cases could be dealt with by clearing up the amnesia for the war period, or by suggestion in either the hypnotic or the waking state. But there persisted afterwards a state which did not justify turning the man loose upon the world to earn his living.

Dr. E. S. PASMORE did not think cases of dementia præcox were cured, and he referred to Sir Frederick Mott's contribution at the Cambridge meeting of the British Medical Association, in which he set out his pathological findings in 30 cases of dementia præcox, showing that the brain and body generally were badly developed. Cases alleged to be cured by psychoanalysts could not have been dementia præcox.

Dr. HELEN BOYLE (Brighton) said the great difficulty was that those most interested in the psychoses did not see cases until they were far advanced. The type of patients she had were those not sufficiently bad to be certified, but requiring treatment. They were mostly cases of psychoneuroses, with a fair sprinkling of cases of psychoses. It must not be forgotten that nearly every disease represented Nature's effort to cure something which did not harmonise with surroundings. Those who rushed in to cure mental diseases might conceivably make them worse; that had been the case repeatedly with physical disease.

The PRESIDENT read a letter from Professor Friedlander (Freiburg) in which he said that Freud was the father of pan-sexualism, and gave the names of many authorities in America and on the continent who rejected it. He contended that Freud's doctrines stood and fell with his interpretations of dreams, and that his proofs were not scientific and convincing. He felt it was wrong to attribute to every neurosis a sexual cause.

The PRESIDENT said it was the glory of the Claybury school that they showed the mechanical basis of all these higher associations, led by Mott, J. S. Bolton, and G. A. Watson, who proved that the supragranular layers of the cortex gradually developed from the earlier undifferentiated infragranular layers. He, the speaker, had tried to show they were mainly the places in which the instincts and ancestral memories were stored. In old persons, in whom, as Mott showed, the lipoids of the testicle were greatly diminished, there was a corresponding want of association, a fading away of the newer associations, and a retrograde return to the dominance of the infragranular layers. Why should so-called sexual exhibitionism be called bestial? It was the judgment of the associational layers of the cortex which had introduced that idea of indecency. It was necessary to throw oneself back into the innocent condition of the child before one could properly discuss these matters.

Reviews and Notices of Books.

VENEREAL DISEASES.

Their Clinical Aspect and Treatment. By J. E. R. McDONAGH, F.R.C.S. London: William Heinemann. 1920. With an Atlas of 106 colour and 21 half-tone illustrations. Pp. 419. £3 3s. net.

THIS book is full of interesting observations collected from a vast amount of clinical material. Throughout the work the author emphasises the importance of careful clinical observation as opposed to pathological examination. Not only can a syphilitic chancre be distinguished from a non-syphilitic one by clinical examination, but some idea of the probable course of the disease may be gleaned from the appearance of a syphilitic chancre. Mr. McDonagh admits that such a laboratory investigation as the examination of a lesion for spirochætes is of value. It is, however, a subsidiary means of diagnosis, and must always be regarded as of secondary importance to the clinical examination.

The author shows a similar suspicion of laboratory methods in deciding when a patient is free from gonorrhœa. He is of the opinion that an elaborate search for gonococci in the urethra or prostate of the candidate for marriage is useless.

"In revising this chapter, after four years, I am even more emphatic on the point that a pathological report is practically useless, and that a clinical opinion is the only reliable means upon which to base an advice on marriage."

The clinical tests for fitness to marry consist of a careful overhauling of the urethra and prostate, with special attention directed to dilatability of the former. If dilatability by means of a Kollman is below normal "the chances are that there are gonococci hidden in the follicles or in the subepithelial tissue." Dilatation will probably wake them up, and a big injection of a potent non-sensitised vaccine will also help to do this. If the dilatability is normal, and if a vaccine does not alter the status quo, the patient may be passed as a fit candidate for marriage. However, it is in the section of the book devoted to the subject of syphilis that the chief interest lies. Mr. McDonagh's views concerning the pathology of syphilis are already well known. In the work under review the clinical rather than the pathological aspect of the subject is considered, although the author does not lose the opportunity of bringing forward points in favour of a cycle in the life-history of the organism of syphilis.

Chapter XI. is devoted to the subject of syphilis of the nervous system. To such an extent is neurosyphilis on the increase that Mr. McDonagh believes that the day will arrive when syphilis will be considered, broadly speaking, a disease of the central nervous system. The best method of combating this increase is, of course, the earlier diagnosis and prompter treatment of the primary lesion. When syphilis has become generalised more prolonged treatment is required than is commonly employed. More attention should be paid to the intermittent treatment and less to the attainment of a negative Wassermann. Finally, in the author's opinion intramuscular injections of intramine are of great service in this connexion.

"Much nervous syphilis can be prevented by the routine use of intramine, which prevents arsenic and mercury from exercising a toxic influence on nerve tissue, thereby rendering it a locus minoris resistentiæ for the syphilitic organism. This is proved by the fact that I have seen only one neuro-recurrence occur in cases so treated since 1915."

Although the author has intended to confine himself to the clinical aspect of his subject he cannot resist the temptation to indulge in speculation on the pathology of disease and the action of the therapeutic agents employed in its treatment. It is here that the weakness of the work lies. Mr. McDonagh has imagination, a gift that is as valuable to the scientific as it is to other kinds of writers. But the scientific writer with imagination must ever keep in mind the foundation on which he builds. Upon a given base a certain amount of superstructure may be erected. However plausible the theory, the fact that it is a theory must never be lost sight of. Mr. McDonagh is generally ingenious, but he

is frequently unconvincing. He builds on precarious foundations. He is frequently illogical.

The book is beautifully and lavishly illustrated. The coloured plates are, indeed, exceptionally good. Whilst Mr. McDonagh's work is full of points upon which a hostile critic might dispute, it is full of interest. Amongst the colourless works on venereal disease which are appearing almost weekly, it stands out conspicuous for its originality. Many will strongly disagree with the views it contains, but few will deny that it is suggestive and stimulating.

ESSENTIALS OF TROPICAL MEDICINE.

By WALTER E. MASTERS, M.D., M.R.C.S., L.R.C.P. London: John Bale, Sons, and Danielsson, Ltd. 1920. With index. Pp. 702. £2 2*s*.

THE preface says that this work contains nothing new, and is not intended to act as substitute for any other work. Its aim is to furnish a digest of tropical medicine in a form handy for ready reference—a vade-mecum, in short, for the student and busy general practitioner. That there is a use for such a work is evident, if we consider how tropical medicine has expanded and how much zoology is now included under the term. As a result the standard books have become somewhat bulky and unwieldy, and the necessity of a digest of them is rendered real, especially for those who cannot follow new papers in the different journals. Dr. Masters attempts this ideal and has succeeded, on the whole, very well, although the book, with its appendices and index, runs to 702 pages. A book of "Essentials" should be free from error, but this is unfortunately not quite the case here. On p. 42 the statement is made that amœbic dysentery frequently attacks the small intestine, while of bacillary it is said that it is nearly always confined to the large, whereas it is just the other way about, and such a statement may lead to grave misunderstanding or even to a student failing in an examination. Again, on p. 29 no mention is made of *S. mansoni* dysentery nor of heterophyes enteritis. But these are points which can be remedied in a subsequent edition. The book contains valuable information and will serve a useful purpose.

LE CŒUR ET L'AORTE.

Études de Radiologie Clinique. Troisième edition. By H. VAQUEZ and E. BORDET. Paris: J. B. Baillière et Fils. 1920. Pp. 259. Fr.20.

THE third edition of this well-known monograph contains a good deal of new matter. The early chapters contain an excellent description of technique. The authors are well known for their warm advocacy of the orthodiagraphic method. Using this as a routine plan, they have arrived at a multitude of diagnostic conclusions, of which this general criticism may be offered, that their clinical judgments do not seem to have been adequately checked by post-mortem data. To those for whom skiagraphy of the heart and aorta means no more than a search for aneurysms, it will be instructive to remark that less than one-twelfth part of the book concerns itself with the aneurysmal shadow. The interesting chapter on pericardial lesions includes no remark on the skiagraphic appearances of pneumo-pericardium, but we have noted no other serious omission. The book is the handiwork of two enthusiasts, and gives the fullest account of the subject yet published.

OPHTHALMOLOGY.

For Students and Practitioners. By A. BRÜCKNER and W. MEISNER. Leipsic: G. Thieme. 1920. With 126 figures and 1 coloured plate. Pp. 650.

THIS is a business-like and efficient account of the subject written by two chief assistants of Professor Kruckmann of Berlin. The whole subject is covered, and though the illustrations are limited in number on account of expense, they appear to be well chosen and clear. The authors express the fear that many students in Germany will not be able to afford to purchase one of the larger works, and offer this one as containing all the essential matter to be found in them, while omitting what is non-essential. On the whole, they have performed their task well. Here and there they are not quite up-to-date. Donders's chart of the relation between age and presbyopia has been shown to give more nearly the minimum than the average accommodation at different ages. Again, senile macular degeneration is well described, but there is no mention of the similar condition which is sometimes found in early life in more than one member of the same family, and may be associated with mental defect.

THE MENTAL HYGIENE OF CHILDHOOD.

By Dr. WM. WHITE. London: Heinemann and Co. 1919. Pp. 194. 6*s*.

THIS is a careful psychological analysis of the development of the child mind from infancy to adolescence, written primarily for parents and teachers. It is distinctly Freudian, and the parent must not become alarmed when he reads that much of the infant's activities, such, for instance, as his unconcern at showing himself naked, are of a sexual character; he will find statements much more startling as he proceeds. Dr. White, to a large extent, discounts heredity as a factor, maintaining that the child's environment during the first five years of life is of much greater importance in the formation of character and tendencies, and many will agree with him. He maintains that hereditary tendencies may be modified, or diverted into other channels when the child is young. He is convinced that our present educational methods tend to sacrifice the individual to the formal scheme. There is an interesting chapter on the function of parents, and the book will undoubtedly be widely read in the American home.

JOURNALS.

British Journal of Tuberculosis.—The July number contains a generous tribute to the life and work of Sir William Osler by Dr. S. Adolphus Knopf.—Dr. H. Batty Shaw, dealing with the distinction between pure pulmonary tuberculosis and the compound disease known as consumption, stresses the importance of secondary infections, and suggests that if these can be eliminated the course of pure pulmonary disease would be fibrotic and benign.—Dr. John Craig-MacGown writes about muscular changes in pulmonary tuberculosis, and Dr. W. Gordon shows how his studies in the relation of rain-bearing winds to pulmonary tuberculosis are illuminated and corroborated by Dr. Brownlee's researches into the epidemiology of phthisis.—Dr. W. A. Muir discusses the value of v. Pirquet's test, and Dr. E. Gladstone Davies gives an account of the tuberculosis campaign of the American Red Cross in France.

American Review of Tuberculosis. Baltimore: National Association for the Study and Prevention of Tuberculosis. 50 cents.—The June number begins with a paper by Dr. Arthur L. Bloomfield, in which he describes certain experiments dealing with the growth of bacteria in the upper air-passages. He finds these passages unfavourable to the growth of various bacteria, and he suggests that some preliminary injury may possibly be essential to the initiation of such diseases as pneumonia and tuberculosis. Discussing 24 years' experience with the subcutaneous tuberculin test, Dr. Lawrason Brown and Dr. Fred H. Heise note that this test has gradually fallen into disuse. One of the authors has had two or three severe reactions (104°) to tuberculin, a spray of which was inhaled. They used Koch's old tuberculin (O.T.), and are convinced that, if the test is carried out carefully "..... the evidence is overwhelmingly in favour of no permanent harm being done....." Their material consists of 324 patients, 42 of whom failed to react to a second dose of 0·01 c.cm. O.T. (10 mg.). It is interesting to note that none of these 42 is known to have died of pulmonary tuberculosis. The authors confirm the current view that the significance of a negative test is much greater than that of a positive test. Dr. Martin F. Sloan contributes to the already prodigious output of papers concerned with the relation of influenza to pulmonary tuberculosis. He refers to 29 representative and widely scattered sanatoriums which admitted 7871 patients, 15 per cent. of whom traced the onset of tuberculosis to an attack of influenza. Dr. H. J. Corper and Dr. H. Gauss describe experiments showing that the effect of heat and venesection on tuberculous guinea-pigs is negligible.—In a paper on Work for the Tuberculous, Dr. David A. Stewart discusses, with considerable impartiality, the burning question of colonies, and he diplomatically remarks that what may be very suitable in England may be "entirely unworkable" in Western Canada.—The final paper, on the Influence of Climate on Pulmonary Tuberculosis, by Dr. John W. Flinn, adds nothing new to a very old problem.

THE LANCET.

LONDON: SATURDAY, AUGUST 21, 1920.

Hysteria as Purposive Inattention.

IN his Croonian lectures delivered before the Royal College of Physicians of London, and published in recent issues of THE LANCET, Dr. ARTHUR F. HURST, through whose hands at the Seale Hayne Hospital there passed during the later years of the war an immense number of functional cases of all sorts and conditions, has outlined in some detail his views on the essential nature of hysteria, citing in support many examples of hysterical disorder which have yielded to his treatment. The lectures deal mainly with hysterical disturbances of the special senses and of cutaneous sensibility, although much else of interest therewith is incidentally touched on. Dr. HURST is apparently an adherent of the pithiatic school of BABINSKI, whom he follows in asserting that "hysteria is a condition in which symptoms are present which have resulted from suggestion and are curable by psychotherapy." At the same time he avoids the difficulties inevitably encountered in any too rigid limitation of this criterion by accepting and, for that matter, corroborating and extending by exact observations of his own, the view that hysteria may and can alter cutaneous, vasomotor, and other reflexes; his explanation of the production of such departures from the normal, however, has little to do with any action of suggestion in the strict sense of the word. Dr. HURST is of those who reject altogether the specificity of hysteria as a morbid entity; if the suggestion is powerful enough "there are probably no individuals who would not develop hysterical symptoms"; abnormal suggestibility is a predisposing but not an essential factor. By this simplification the vexed questions of what constitutes abnormal suggestibility, what is the state of mind allowing it, which suggestions are responded to and which repelled, whether those accepted have significance in connexion with the previous experiences and unconscious desires of the individual concerned—such questions of psychological import are ignored. Anyone will develop hysteria if the provocation is sufficiently great; otherwise expressed, the hysterical mind has no characteristics distinguishing it from the normal mind.

Although, as far as we have noticed, Dr. HURST does not actually so express himself, it might seem that this view brings his position to some extent into line with the conception frequently expounded of recent years, that hysteria and the psychoneuroses generally are to be regarded as modes of reaction of the organism to its environment, a biological conception no less applicable in the psychical than in the physical sphere. Now if this hypothesis be adopted, it is clear that differences in the psychoneuroses can be only explained either by differences in the individual organisms or in the stimuli brought to bear on them. If we are all potential hysterics in the face of sufficient provocation, then groups of fighting men—to take an illustration from the material mainly utilised by Dr. HURST—undergoing precisely the same powerful and simultaneously acting stimuli should all have developed hysteria if any one did, a view, needless to say, at variance with known facts. Moreover, not a few men "broke down" within 24 hours' experience of the firing-line, and others before they ever crossed the Channel. Evidently the excitants in such cases were of minor intensity in comparison with what others were at first able successfully to resist, and the conclusion is, indeed, unavoidable that hysteria is in reality a pathological state appearing in certain individuals only who fail to withstand the provocation of their environment because of some inherent or acquired psychical defect. It becomes a matter of surpassing importance to endeavour to determine wherein the imperfect reaction takes its rise, and why suggestion acts in some cases and not in others; and any analysis of the psychological material at his disposal would have enhanced the value of Dr. HURST'S contribution to one of the serious problems of the time.

The major part of the lectures is occupied with a consideration of the mechanism of production of hysterical symptoms, not in the sense of the effect of emotional conflict and tension and its exteriorisation in symptoms, for little or nothing is said of this view of their pathogenesis, but rather along the familiar lines laid down by JANET, that hysteria is a form of amnesia or "absent-mindedness." Dr. HURST adopts eclectically what the French professor admirably demonstrated long ago, that the hysteric does not "attend"; he looks obliquely or askance at things; certain elementary phenomena, sensations and images, cease to be perceived and appear suppressed; there is a lack of psychical synthesis. The student of hysteria knows well the importance of JANET'S work in the development of our modern conceptions of the subject, and he realises the significance of the latter's emphasis on the remarkable fact that the anæsthesia and amnesia of the hysteric are often systematised; in other words, the patient is anæsthetic and amnesic for certain stimuli only, or at certain times only, or in certain circumstances. It was left to the genius of FREUD to make the conception far more complete by his study of the question *why* certain systems of ideas should split off from personal consciousness and *why* the hysteric should cease to attend to certain excitations. With these psychological matters Dr. HURST is not concerned; but, assigning a causative rôle to the inattention, which is a symptom, he makes the speculation that "the structural basis of the psychological act of attention consists in some change which leads to a diminution in the resistance offered at each synapse of the sensory tract." The hysterical patient is deaf because he does not attend to sounds, and because he does not attend he does not hear, the suggestion being that inattention consists physiologically in a "throwing out of dendrites, or in some biochemical change in the material which occupies the space between the dendritic terminations of adjacent neurones." It should be remarked that Dr. HURST uses the term attention in a sense which makes it difficult to distinguish from a mere physiological process; "this active attention is as little a conscious process as the performance of the individual movements in walking." Apart from the essentially speculative basis of any theory

of dendritic action, and from the fact that the inattention itself requires to be explained, it must be pointed out that the difficulty in this view of the production of hysterical phenomena is its failure to account for the systematised nature of many hysterical symptoms. We know that the hysterically blind, or deaf, or anæsthetic do, in fact, see, and hear, and feel, as can often enough be readily demonstrated; certain stimuli are perceived, but others do not appear to be, and analysis will reveal an actual psychological explanation of this condition of purposive inattention. There can scarcely be a physiological impairment in peripheral synaptic action when stimuli are, in fact, perceived, though some are not apperceived; and it seems immaterial to seek a physiological theory of dendritic oscillation for acceptance or inhibition of sensations when the clue can be readily found in the psychological sphere.

Discussion of this matter, none the less, has a wider bearing than might appear. If we suppose some of the somatic and visceral phenomena of hysteria to be the outward expression of disintegrative action of neuronal systems, as nervous health is of an integrative action—a view which has been suggested by OPPENHEIM, BINSWANGER, and others—we may ask to what level temporary functional disintegration can on occasion extend; and much of Dr. HURST'S investigation of somatic symptoms can be profitably utilised in consideration of the question. He has adduced evidence which goes to show that the function of mesencephalo-spinal reflex arcs can be put in abeyance in the course of hysteria, indicating that the neuronal disintegration may extend far below transcortical paths if the condition is profound enough. The psychologist may ignore the neuraxis and its function when he has found the cause of a patient's hysteria in an emotional conflict, but the neurologist is legitimately interested in explaining the absence of the plantar reflexes, or even, if Dr. HURST'S statement be accepted, of the pupillary reflex to light.

Medicine and Aeronautics.

THE practical part to be played by medicine in the development of aeronautics was more than suggested at the recent Aeronautical Exhibition, where a gallery was set apart for the use of the Air Ministry. The Medical Section was divided into three subsections. In the first were demonstrated the apparatus and material which medical officers had helped to design for the general welfare of the pilot. In the second subsection the apparatus used by medical officers during their researches into the question of physical efficiency and flying ability were set out; while in the third a model room as used for the examination of the civil pilot of to-day was shown. These several subsections demonstrated not only the influence of medical research directed towards aeronautics in other and general medical fields, but they also proved the advantages and possibilities of team-work between those engaged in progressive medical work and men of science working upon other lines or specialising in other professions. The exhibition as a whole, with its promise of rapid future transport, conveyed the uncomfortable message that the spread of communicable diseases might be considerably accelerated, and this is a matter which will require watching, but is not under discussion here.

The influence on general medicine of work in the first instance devised for aeronautic purposes was well exemplified by an exhibit of the apparatus employed for the administration of oxygen to flying men. One type of this apparatus, which was shown in its various stages of development and design, as well as in its perfected form, has since become the standard apparatus for use in many of our hospitals. Now that it has been seen and tried, it becomes surprising that the unscientific and wasteful method of giving oxygen to patients by means of a glass funnel attached to an oxygen cylinder, without any graduated regulating tap or proper reduction valve, was not abolished long ago in favour of proper regulating appliances and a suitable mask. So the need of the airman has benefited the whole of practical surgery, and suitable types of oxygen apparatus can now be purchased for use at the bedside, in which the actual quantity of gas supplied per minute to a face-mask worn by the patient can be accurately gauged. Another piece of apparatus shown in the Medical Section may also eventually prove to be of value for other than air medical problems. This is the gas-mixing apparatus designed by Professor GEORGES DREYER in collaboration with Mr. G. F. HANSON, an American worker on problems of physical efficiency. This apparatus is primarily designed to estimate the ability of individuals to withstand great altitudes by the gradual addition of nitrogen to the air breathed, thus reducing the percentage of oxygen. It is so constructed that it can supply any two gases, or any two liquids, in constant volume in any proportion required, accurately and steadily. The adaptation of this principle to the administration of anæsthetics should prove useful—here is a line along which our anæsthetists might work; while in trades where liquids or gases have to be mixed in definite proportions its scope of utility is obvious. It has, for instance, been shown that it is possible to maintain the exact proportions of air and petrol vapour required for the most efficient explosion, so that neither waste nor starvation need occur. With petrol at its present price the economy that should result is not negligible. In the direction of clothing and personal equipment, practical lessons have also been learned from the medicine of the air which can be applied to the medicine of the home or the institution. Electrically heated clothing, special goggles, safety belts and helmets, have been devised, and the practical use is thus demonstrated to which physiology and anatomy can be put when applied in close collaboration with non-medical experts. The extension of this field of coöperation is bound to bring good results, for in this way the medical man is brought into closer and more personal touch with working conditions, while trained and scientific technicians will have a better chance of placing a knowledge of psychology at the disposal of industry.

We trust that many of our readers saw the exhibition of a model room as arranged for the examination of pilots; it contained within its walls a summary of much that was instructive and interesting in regard to many difficult questions of physical efficiency. The examination of pilots has now become a question of distinguishing differences among those who would always be passed as first-class lives by an insurance office. It has been found that only those who can meet satisfactorily the necessary tests of insurance examination can withstand the stress of air work, and it has been assumed that this class can resist

infection generally better than others. But the strain of air work must be looked upon as a concentration of the strains of ordinary life, and first-class lives among non-flying individuals, though falling into the highest categories of physical efficiency are not asked to bear this concentration, apart from the question of special risk. It is not, in a scientifically ideal condition of things, sufficient for the airman to be what is called by the insurance office a first-class life; we must try to subdivide the first-class lives and to ascertain which of the individuals possessing this happy standard can satisfy the accurate application and interpretation of the special tests elaborated for the selection of pilots. Just as the object of all modern medicine is to ascertain the symptoms of disease in its earliest stages, so the examination of pilots attempts to ascertain not only the proofs of physical stamina but the earliest signs of impending physical inefficiency. With what measure of success can be gauged by the pre-eminence of our pilots in the war. It is largely due to the special work of Wing Commander MARTIN FLACK and Professor DREYER that it is now possible to estimate, and record accurately, minor signs of physical inefficiency long before gross lesions make their appearance. Progress on the road towards the absolute measurement of physical fitness may be said to have commenced satisfactorily, and here again the medicine of the air may be vitalising the medicine of civil life. The practical utilisation of the tests devised for air men by insurance companies should become a matter of importance, as it is clear that if by means of a few simple measurements individuals can be graded within the general category of those physically efficient, we have a means of reducing the premiums asked in the case of those falling within the higher categories. Medical examiners may be able to "sense" disease before it makes its appearance, the measurements employed being in their turn direct inducements to the maintenance of physical health among the candidates for insurance. Insurance companies often grant a reduced premium to teetotallers, and it should be possible to arrange that insured lives when particularly physically fit should reap similar advantage at the time of insurance, and they might even gain further advantages of reduction of premiums if they were prepared to submit themselves to special tests of this nature from time to time. Work is being constantly carried out by the medical department of the air force in the endeavour to add new methods of accurately measuring the degree of efficiency of the various systems. The possibility of utilising such special war work as air medical work for the general benefit of industry and preventive medicine must never be forgotten.

Your Telephone Number.

WHEN is an advertisement not an advertisement? Medical men resident within the London telephone exchange system have during the past week received a circular letter from a business firm detailing an agreement made with the Postmaster-General which has a bearing upon their convenience, although they have not been consulted. This agreement is to supply free of cost to every London telephone subscriber a copy of a classified directory of trades and professions, including the profession of medicine. Four specimens of the type to be used for this supplement are given in the circular; these increase in magnificence from ordinary brevier to bold pica, the cost of the insertion varying in accordance therewith from one to four guineas. No indication is afforded to the medical man of the appropriateness of the type which he should select. In the examples given members of the London Stock Exchange are suggested as requiring a one-guinea insertion, solicitors a two-guinea, printers a three-guinea, and engineers a four-guinea insertion. The naïve note is appended that professional entries in this publication are not advertisements. Whether they are advertisements or not may well be left to the decision of a less interested tribunal, but it is difficult to see what the inserter is asked to pay guineas for if it is not to make himself better known. In the meantime, we should like to know to what extent classification is being carried out, and whether doctors are to be scheduled in this publication under specialist subheadings. This, at all events, the medical profession is entitled to have some say in. In any case, we fear that a list issued along with an official postal document may convey the impression to unwary telephone subscribers that only the names included in the directory are those of authorised medical practitioners. If the classified directory is to contain medical names at all it is in fact putting pressure on doctors to advertise in it (we use the word advisedly) at one to four guineas a head. As far as medical men are concerned the telephone directory as it stands serves its purpose quite well, which is simply to enable the patient to communicate with his doctor. And what more is wanted? The Medical Directory provides a reference book of professional attainment such as is held to be proper and convenient by the medical profession as a whole. We hope that London medical men will not waste a guinea on what may put them in rather an invidious position.

The Proposed International Health Office of the League of Nations.

IN our issue of April 24th last we referred somewhat fully to the proposals made by the International Conference of Public Health Experts, held at the Ministry of Health in London in April, at the request of the League of Nations, to advise on the steps which should be taken to provide the League with a suitable organisation for dealing with international health questions. The London conference, it will be remembered, made a series of detailed recommendations regarding the functions and duties of the proposed organisation, the incorporation within it of the existing Office International d'Hygiène Publique established under the Rome Convention of 1907, and the nature of the permanent machinery which the new International Health Office would require. An important further step in this direction was announced at the conclusion of the recent meeting of the Council of the League of Nations at San Sebastian. The Council have now adopted the scheme prepared in London, with a few minor amendments, and have unanimously recommended it for formal adoption by all the nations in the League at the General Assembly which will be held in Geneva in November.

Annotations.

"Ne quid nimis."

THE POSITION OF THE MEDICAL PROFESSION IN VIENNA.

THE special article on Economic Conditions in Vienna, which appears in another part of this issue, pictures the fate of the middle-class in general. The medical profession is involved in the common ruin. The doctor's expenses have risen quite out of proportion to the fees which it is possible for him to charge. The maximum consulting fee in Vienna at the present time is 100 kr., with a purchasing value, expressed in English money, of about 3*s*. 2*d*. With so many members of their own social class in dire poverty, not a few Viennese doctors are doing their professional work for nothing. But the cost of drugs and medical appliances has, of course, risen just like other things. Those who are intimately acquainted with the work of the medical profession in Vienna testify that it has been maintained as yet at a very high standard. All that the doctors can do they have done. In spite of low salaries, public health work in all its branches, the prevention of epidemics, and the care of infant life are first-rate. As a matter of fact, the infant mortality did not rise in spite of the terribly high general death-rate, a result which may fairly be ascribed largely to the organisation of infant welfare centres, rapidly extended during the war in the face of economic difficulties. The campaign against tuberculosis has gone steadily forward in the dispensaries, sadly hampered, it is true, by the impossibility of increasing sanatorium accommodation; and although the widespread malnutrition has made some increase in the tuberculosis mortality inevitable—the rate has increased from 30 to 58 per 10,000—it is a surprise to those who best know the local conditions that this increase is not still greater. Here the result is much to the credit of the tuberculosis dispensary staff.

Medical practitioners in more fortunate circumstances might stop to think what it means to colleagues, who know the possibilities of modern medicine and who are accustomed to give their patients the benefit of recent discoveries, to be forced to return to the weapons of previous generations—often, indeed, without even their modest equipment. The restriction of anæsthetics and of dressings for operations, and the total lack of clean linen for the patients make appeal to the non-medical mind, and relief funds have been available to some extent to remedy the needs, but doctors alone can realise what it is to do without important drugs, the essential parts of X ray and other complicated apparatus, stains for bacteriological work, animals for inoculation and serum preparations, and a thousand other things to which a committee, charged with the care of half-starved children, can hardly apply their scanty funds. English and American doctors now helping in Vienna see how painful is the lot of their colleagues obliged deliberately to lower the standard of their work in a city of magnificent institutions with appliances out of order for want of some comparative trifle. Nor is it less hard to see patients die for want of treatment which a little money could get them, even if it be remembered that 50 years ago there would have been no alternative to death. Isolation from scientific workers in other countries is also keenly felt by the medical profession in Vienna. They cannot afford to buy books or medical papers from other countries, and still less can they afford, even should passport facilities be available, to travel abroad. Medical visitors are warmly welcomed in Vienna that they may apply their experiences of work done in England during the war period.

Individual help given to a starving city may seem like a drop in a bucket, but there is no reason to doubt that an organised scheme on the part of the medical profession at home to help their Vienna colleagues would meet with tangible results. A beginning has already been made through an influential University Relief Committee and through special committees for practitioners not connected with the University. The Friends' Relief Mission now working in Vienna, of which Dr. Hilda Clark is organising secretary, can arrange for any help that is forthcoming to be given to the medical school, both staff and students, or to doctors in general practice. Clothing is especially needed, and those who have no money to spare can give old garments, which the Viennese are clever at re-making. Gifts in kind meet with ready acceptance.

DR. MARCEL BLOCH ON COAGULATION.

IN the course of an article which appeared in our French Supplement on August 7th Dr. Marcel Bloch dealt with the measurement of the coagulability of the blood and with the clinical conditions under which the blood coagulates less readily, putting forward in so doing a new and interesting view of the relation of calcium to coagulation. It has long been known that, in order to bring about the formation of thrombin, calcium must be present in ionic form, and that citrates render blood incoagulable by uniting with calcium to form a non-ionised, though still dissolved, compound. Dr. Bloch suggests that in the circulating blood calcium is present in a non-ionised or, as he prefers to call it, an inactive form, and that, when blood is shed, external processes bring about the conversion of inactive to ionised calcium, and so permit coagulation to occur. The external processes include contact with foreign surfaces and the setting free of kinase. If we understand him rightly, Dr. Bloch further believes that delayed or imperfect activation (ionisation) of calcium, when blood is shed, may be responsible for the lessened coagulability of the blood in hæmophilia and other clinical conditions.

Although Dr. Bloch does not himself bring forward any evidence in support of this theory, there is reason to believe that some calcium is present in the blood in combination with protein; and, since such compounds are very slightly ionised, the calcium thus combined would be almost entirely inactive as regards the process of coagulation. But the presence of inorganic calcium salts in the urine points very strongly to the existence of such salts, presumably chloride or phosphate of calcium, in the circulating blood plasma. If this is the case, calcium will undoubtedly be present in its ionic form in the circulating blood. It is clear, therefore, that there are difficulties in the way of accepting Dr. Bloch's suggestion, and that direct investigation of the form in which calcium exists in the circulating blood is desirable in order to substantiate this view.

The surgical interest of Dr. Bloch's paper lies in the bearing which his investigations may have upon the use of sodium citrate in blood transfusion. The clearer our conception is of the precise manner of action of the sodium citrate in preventing coagulation the more satisfactory is the use of citrated blood in hæmorrhage, shock, and blood diseases likely to become. It is at present not entirely so because sodium citrate is undoubtedly toxic, the degree of toxicity varying according to the idiosyncrasy of the patient. It is desirable therefore to use the minimum amount of sodium citrate compatible with its efficient action, and to arrive at this it is necessary to have a precise knowledge of the nature of the reaction that is taking place. It may even be useful to apply Dr. Bloch's method of measuring coagulation indices to the blood of a particular donor in order to determine the precise quantity of anticoagulant that may be necessary to prevent the clotting of his blood; not, of course, in an emergency, but in ordinary therapeutic blood transfusions. It is hampering to the surgeon to lack the means of inactivating the calcium electrolyte in the circulating fluid when this, through some obscure cause, has become abnormally active. Sodium citrate does not have this action in the circulation because it is rapidly destroyed; it has even been stated that injection of sodium citrate into the circulation increases the coagulability of the blood. A patient died recently in St. Bartholomew's Hospital from a pulmonary

embolism, some time after having been admitted for injuries received in a fall from a window. There was a superficial wound on the outer side of the right leg, but this had healed by first intention, and no other injury or septic focus in the limb was discovered post mortem. Nevertheless, its main venous channels were found to be occupied by a blood clot extending from the foot to the common iliac vein. This can only be explained on the hypothesis of an altered coagulability of the blood produced by some unknown factor. The surgeon is in need of an accurate method of measuring coagulability, and Dr. Bloch's work may help him to get it.

WORKING OUTPUT AGAIN.

LAST week we noticed in an annotation an important contribution by Dr. H. M. Vernon on output in relation to altered hours of work. Those who are accustomed to think of the United States as ahead of us in industrial matters will be astonished to find that a report[1] just published is the first of a series to be issued under Government authority dealing with problems of industrial working capacity. In the States spade-work upon these problems has not been so extensive as might be expected. The present report, however, is a serious contribution to knowledge. It contains data collected, not by the useless questionnaire method, but by investigators, thus enabling the reader to check the conclusions. The information set out was gathered from two engineering factories employed one on an eight-hour day, the other on a ten-hour day. The onset of fatigue is studied from the hourly rise and fall of output in the two plants and from the hourly accident-rate. Labour turnover is compared under the two systems, and the effect of the experimental introduction of rest pauses. An interesting preliminary note upon a study of rhythm in industrial work is also included. The comparison is strongly in favour of the eight-hour system in every case. Unfortunately, the articles produced in the two factories were not similar, and difficulty faced the investigators in establishing a fair comparison. We do not feel confidence that the difficulty has been satisfactorily overcome. Thus, to permit of comparison, processes are grouped after inspection into dexterous handwork, muscular handwork, lathe machine-work, and miscellaneous machine-work; then the curves of output of the groups in the two plants are compared. This method presupposes correct grouping, one of the matters under investigation. A sounder procedure would have been to group the processes together of which the curves of output proved similar and then to examine the processes so grouped to see what common characteristics they possessed. The method adopted smacks of a priori reasoning. Our confidence in the conclusions drawn is especially strained when they are at variance with those drawn by other investigators; further, we may express regret that the work of Dr. Vernon is somewhat unnecessarily attacked. An instance may be given of a conclusion which does not appear to be justified by the data. Comparison is made in the ten-hour plant between the curves representing hourly output and hourly accident-rate. The two are not found to keep parallel; and the steeper rise of the accident-rate while the output is still rising is held to indicate the appearance of diminishing neuro-muscular coördination (claimed to be a sign of incipient fatigue) before output commences to fall. If this conclusion is correct, the definition of fatigue[2] as "the sum of the results of activity which show themselves in a diminished capacity for work" falls to the ground. Therefore this conclusion challenges attention, apart from the fact that Vernon's work is attacked on the strength of its correctness.

The report itself, however, provides evidence—not used for this purpose by the writers—that the curves of output and of accident-rates used are not really comparable, from which it follows that the conclusion is not soundly based. This evidence we will explain. Output increases per worker with length of employment—even in the case of simple repetition processes some four months must elapse before it attains a reasonable level, and in complicated heavy processes some 12 months may be required;[3] therefore, even if the personnel of a plant is evenly distributed according to length of employment, the output curve tends to represent the activity of those with longer employment rather than of those with shorter employment. But at the ten-hour plant 66 per cent. of the personnel had been employed more than six months, from which the conclusion follows that the output curve is mainly representative of the output of this 66 per cent. of the workers and not of the output of the remaining 34 per cent. of newer workers. The probability (which almost amounts to a certainty) is that the curve of output hour by hour of the 34 per cent. of workers with less than six months' experience, who for lack of skill and practice will be especially affected by industrial environment, would be entirely different, and that no deduction as to the activity of this 34 per cent. can be drawn from the general output curves. On the other hand, accidents are definitely stated to have been more prevalent during early weeks and months of employment than during later periods, "the level of the accident-rate varies inversely with the experience of the workers": 34·7 per cent. of all accidents are stated to have occurred during the first three months of employment, and 13·8 per cent. during the next three months—i.e., 48·5 per cent. of all accidents occurred among the 34 per cent. of workers in their first six months of employment. The accident curve then is composite, and represents about equally the tendency of accidents to occur hour by hour among those employed less than six months, and among those employed over six months, but does not represent accurately the tendency to accidents of either group. Clearly no sound deduction can be based on a comparison of these two curves; much less an attack upon the work of others.

Further, the disparity of the curves of accidents and output was found less striking in the case of the eight-hour plant, and this is ascribed in the report to the presence of less incipient fatigue due to shorter hours. But at the eight-hour plant the proportion of operatives with less than six months' experience may be fairly presumed to have been far less since the labour turnover, 30 per cent. per annum, was nearly six times lower than that, 176 per cent., on the ten-hour plant. Hence on the eight-hour plant the curves of accidents and output more nearly approach to being comparable factors, but whether sufficiently so to base conclusions upon cannot be determined from the data given. Notwithstanding these accidental occurrences, which must often appear when work is embarked upon in an unfamiliar field—they are like the tendency to accidents among those newly employed—we welcome this contribution to the study of the human machine, its activity and health, and look forward to the issue of later publications from the same source.

CONGRESS OF COMPARATIVE PATHOLOGY.

THE Second International Congress of Comparative Pathology will be held in Rome in April, 1921, under the distinguished presidency of Professor E. Perroncito, late director of the Royal School of Veterinary Medicine at Turin. A preliminary programme has been issued in which the secretary-general of the Congress announces that he is prepared to receive titles and abstracts of papers dealing with comparative pathology of man, animals, and plants, which should reach him before Dec. 15th, 1920. The Congress will be conducted on lines similar to those of the first Congress held in Paris in 1912; the fee for admission will be 40 lire, and arrangements are being made to secure reduced fares by land and sea to its members. Professor G. H. F. Nuttall (Longfield, Madingley-road, Cambridge) has been entrusted with the task of forming a committee

[1] Comparison of an Eight-hour Plant and a Ten-hour Plant. Public Health Bulletin No. 106. 1920. Government Printing Office, Washington. Pp. 213. 25 cents.

[2] Industrial Fatigue and Its Causes. Health of Munition Workers Committee. Memo. No. 7 (Cd. 8213), 1916.

[3] The Speed of Adaptation of Output to Altered Hours of Work. Industrial Fatigue Research Board, Report No. 6, 1920.

in this country to further the work of the Congress, and, pending its formation, will be glad to receive communications and names of intending members. Among the subjects already proposed for discussion are influenza in man and animals, foot-and-mouth disease, cancer, hydrophobia, diseases of cattle, poultry, and bees, various parasitic diseases, and nerve regeneration. Further suggestions will be welcomed if sent to Professor Nuttall or direct to the Secretary-General, Professor Mario Levi Della Vida at 58 Via Palermo, Rome.

PELLAGRA AT PORT SAID.

INFORMATION goes on accumulating bearing on the ætiology of pellagra in the Near East. In a report recently issued Dr. R. G. White, deputy director of the Public Health Laboratories, Cairo, states that on Sept. 13th and 14th, 1915, there arrived at Port Said 4058 Armenian refugees from the neighbourhood of Antioch in Syria, consisting of the survivors of the inhabitants of five villages after 45 days' fighting with the Turks; they were in a very debilitated condition. The children under 14 numbered 1563. These unfortunates were accommodated in camp on the eastern side of the Suez Canal, occupying the buildings of the quarantine lazaretto and tents pitched on the neighbouring desert ground; the camp was carefully laid out and its sanitation well looked after. The water-supply was derived from the Port Said Water Company and was ample and satisfactory. About the beginning of February, 1916—that is, four and a half months after the arrival of the refugees—stomatitis and diarrhœa began to be prevalent. Two months later a symmetrical rash on the hands was noted in two or three cases. These increased in number, and early in May were recognised to be pellagra. By the middle of June some 400 to 500 of the refugees were showing signs of this affection, the cases being distributed throughout the encampment. The condition was more marked among the older people, and of the 1200 children attending school only 50 showed any symptoms, and these were of a very mild type. It is to be noted that the school children received two small buns daily in addition to the usual ration. There was some improvement in July, but in September the number of cases increased, and there appeared to be an exacerbation of the symptoms. The total cases amounted to 639 in 1916 and 14 in 1917. Of this total (653), 79 per cent. were among females. The age varied between 4 and 95, averaging from 20 to 50 years. The duration averaged five months, and the mortality (38) was at the rate of 5·8 per cent. of the cases. A revised dietary was drawn up in October, 1916, and a special "anti-pellagrous" diet, including fresh foods and milk, was issued in February, 1917, the fatty elements being raised from 46 to 90 g. daily. From this time pellagra began to diminish, and no fresh cases occurred after June, though old cases still appeared from time to time at the out-patient dispensary. Opportunity was afforded in July, 1916, for comparing the condition of these Armenian refugees at Port Said with that of a large number of Jewish refugees at Alexandria. It is estimated that 10,000 of these latter arrived between the end of 1914 and the time of this inspection, but only 2080 were then remaining in the encampments, the rest having left for Armenia and elsewhere. There was a very marked difference in the physical conditions of these two collections of refugees. The difference in the official food rations supplied to each was very slight as regards nutritive value; but the Jews were mostly town-dwellers, continuing to lead a life not unlike their former condition, and were able in many cases to obtain some employment, and so supplement the food supplied to them. It was noted that the Armenian refugees, who were accustomed to olive oil, disliked the cotton-seed oil supplied, and that this was not the case with the Jews, who consumed distinctly more oil. The Jews also were supplied with wheaten bread, while that given to the Armenians at Port Said had 25 per cent. maize mixed with the wheat flour. Dr. White, in concluding this very interesting report (which is fully illustrated with photographs and diagrams), observes that the weight of evidence points entirely to a faulty diet as the causal factor of the outbreak, and that pellagra was eradicated by correcting the faulty dietary, all other conditions remaining the same. Maize may have been a factor, but "certainly had no direct causal relation to the disease, and when an adequate and properly balanced ration was given pellagra disappeared." In regard to the theory of transmission by means of a biting fly (*Simulium*), "nothing of the nature of a protozoal cause could be discovered, nor could any connexion with biting insects be found."

SIR NORMAN LOCKYER.

THE death of Joseph Norman Lockyer, announced this week, will be regretted by a wide scientific circle. He was born at Rugby in 1836. A shrewd and acute observer, he contributed valuably to his own science, that of astronomy, and well earned the Fellowship of the Royal Society awarded in 1869. The year before he had found the helium spectrum line in the sun, a discovery which led the way to the search for terrestrial helium. This gaseous element, as we all know, was subsequently found, and is now playing an important rôle in aeronautics, since, while it is buoyant, it is, unlike hydrogen, non-combustible; and a practical development of its application has been begun in Canada, where it is derived from natural gases. Sir Norman Lockyer did a further service to science when he started the first number of *Nature* in 1869, a journal which soon attained the authoritative position which it has held ever since. Lockyer was created K.C.B. in 1897.

SUBCHRONIC LETHARGIC ENCEPHALITIS.

IN the second number of the *Wiener Archiv für innere Medizin* (Bd. I., Hft. 2, June, 1920), which is being published under the supervision of Professor W. Falta and Professor K. F. Wenckebach, there are seven original articles, the quality of which is all the more striking when the deplorable conditions obtaining in Vienna are considered. In one of these articles Dr. Constantin Economo records in detail a case which shows that lethargic encephalitis may run a subchronic course, terminating fatally after nearly two years of ill-health.

The patient was a man, aged 45, whose illness began on April 5th, 1917, with profuse perspiration and pains in the limbs and back. A few days later his temperature was found to be 38°C. and he was very drowsy. Meningitis being suspected, he was admitted on April 26th to hospital, where he lay unconscious. There was marked rigidity of the body and his head and limbs were extended. No paralyses or loss of reflexes could be discovered, but the reflexes of the abdominal wall were considerably reduced. He groaned, but did not speak, and had to be fed artificially. When light was flashed on his eyes he would turn his whole head away without apparently moving his eyeballs. By June 2nd the drowsiness had passed off and he was less apathetic; he could sit up in bed without help, understand what was said to him, and in large, clumsy handwriting he could show that he understood simple questions, but speech was limited to inarticulate sounds. Later in the summer of 1917 his general condition was better; he could walk, and, as his writing showed, there was no aphasia. There were no sensory disturbances, but certain curious choreiform twitchings of his fingers had developed. At first he could suppress these movements at will. By the end of August they had extended to the lower limbs, causing him considerable discomfort. Wassermann's reaction was negative, and lumbar puncture yielded clear, sterile fluid under little pressure. In 1918 the athetosis diminished, but there was no improvement in the disturbances of speech. He choked over his food and gradually lost ground, becoming apathetic. In spite of careful nursing he became profoundly cachectic and died early in January, 1919.

The most significant feature of the post-mortem examination was the demonstration in various parts of

the central nervous system of both old and recent foci of inflammation. It would thus appear that after the fulminating onset of the disease the organism had been unable to eliminate the virus which had persisted, giving rise to chronic, slowly progressive inflammatory changes. Ultimately they wore the patient down. As Dr. Economo points out, epidemic encephalitis usually terminates in death or complete recovery; the recorded cases of survival of the disease with persistence of a paralysis or some other symptom are very rare. But as this case shows, the disease may remain smouldering for nearly two years, with signs of extension of the inflammation from one part of the brain to another.

THE PROBLEM OF DENTAL DISEASE.

THE deplorable state of the nation's teeth is only too well known, and health authorities are busily engaged in promoting schemes for treatment. At the recent meeting of the British Dental Association at Bournemouth, the chief interest centred around this perplexed problem of the dental needs of the public. Dr. R. A. Lyster, the medical officer for Hampshire, pleaded in eloquent terms for further research into dental disease, and from his remarks as reported it would seem that the fundamental causes of dental disease are unknown and that it is therefore useless to lay down definite rules for prevention. This statement, if it gains currency, will tend to undermine belief in the excellent work that has been done on the ætiology of dental disease and on which the present rules for prevention of dental disease are based. These rules have already stood the test of time and produced excellent results, and have abundantly confirmed the correctness of the views held on causation. Speaking in a general sense, dental caries is due to the altered character of the carbohydrate diet and the enormous consumption of sugars, especially those of the mono-saccharide group. In the case of periodontal disease also it is clear that the lodgment of food in the interdental spaces is a prominent factor. Mr. R. Lindsay in his public lecture admitted that the remedy was largely concerned with food, but considered that to ban any common foodstuff was outside the sphere of practical politics in the question of the prevention of dental disease. But surely, if one is convinced of the cause, it is culpable negligence to evade the teaching of prevention simply because the obstacles to a radical change in diet appear too great. The stoutest wall will give way before constant battering, and so with this question of food and dental caries. Dentists may be appointed to schools, to the army, to the navy, to maternity centres, but little headway will be made towards the banishment of dental disease unless the simple rules of prevention are inculcated. It is, indeed, a stigma to medicine that the most prevalent disease of the human race is the most easily preventable. If the Ministry of Health will concentrate on teaching prevention by means of popular lectures, illustrated with lantern-slides, and by booklets written in simple language, in the course of two generations we shall see an end to preventable dental disease, and there will be but little need for an elaborate public dental service.

THE "DORSAL POINT" IN HEPATIC COLIC.

IN *Lyon Médical* Dr. Raymond Pauly has described a sign which appears to be of considerable value in the diagnosis of hepatic colic. He points out that in this condition, as in all analogous syndromes, there are subjective and objective pains. The subjective pains are generally vague, whether in their form and intensity or in their localisation and radiations, and therefore are not of great diagnostic value. Such is the pain in the right shoulder in hepatic colic. It is seldom described spontaneously, and when asked to show its position the patients indicate vaguely the right shoulder and some even indicate the left. The radiations of the pain are numerous. Professor Chauffard described those which occur in the area of the right phrenic nerve, in the supra-clavicular, supra-deltoid, supra-mammary regions, at the angle of the scapula, and at the eighth, ninth, tenth, and eleventh dorsal spines. The greater part of these radiations are purely subjective and do not correspond to a point at which pain can be provoked by pressure of the finger. But there are two such objective points—the epigastric and the cystic; the abdominal pains, however, being often so intense that it is difficult to demonstrate these points clearly. Dr. Pauly therefore tried whether the vague pain felt in the right shoulder corresponded to a painful point, and in 21 cases constantly found a point tender on pressure between the spinous processes of the vertebræ and the border of the right scapula at the level of the fourth or fifth intercostal space at a distance of 2 or 3 cm. from the middle line. This point is therefore very different from that described by Professor Chauffard in the position of the eighth to the eleventh dorsal spines. Dr. Pauly terms this the "dorsal point" (*point dorsal*). The best means of testing for it is to seat the patient on the bed, with the arms in front to give support. The observer, standing on the right of the patient, presses with his left thumb on the different intercostal spaces between the spine and the right scapula, from above down. On arriving at the fourth or fifth space a painful grimace is provoked, and the patient often sits up brusquely, complaining of severe pain. As a means of control it is always useful to apply the test on the left side. Some patients complain also of pain on this side, but it is less severe. The intensity of the pain varies. Sometimes a cry of protest is provoked; at other times the patient simply says that a little pain has been produced. As a general rule, the intensity of the pain varies directly with that of the colic, and it gradually diminishes as the other symptoms pass off. Is this point more important than the points already described? According to Lejars, the cystic, epigastric, xiphoid, and costal (extremity of the twelfth rib) points may be found in other affections than hepatic colic—in gastric, colic, and appendicular affections. The dorsal point must be distinguished from the "painful points" of intercostal neuralgia, which are near the spine itself and not 2 or 3 cm. distant. Further, the other neuralgic points—lateral, anterior—will also be found. It is important to prove the absence of the point in other painful affections which have to be differentiated from hepatic colic. Dr. Pauly has found the dorsal point absent in gastric and duodenal ulcer and acute appendicitis. Its diagnostic value therefore seems to be established. What is its pathogenesis? The motor and sensory supply of the biliary passages comes from the great splanchnic nerves which originate in the thoracic ganglia of the sympathetic from the fourth to the tenth, but the upper roots are the most important. The communicating rami of these ganglia run in the corresponding nerve roots, and can thus affect the nuclei of the corresponding sensory nerves. Thus the sign is due to hyperæsthesia of the area of distribution of the posterior branch of the fourth and fifth dorsal nerves. A matter which is not explained is, Why is not the painful point of hepatic colic at the same site as that of intercostal neuralgia?

THE U.S.A. AIR MEDICAL SERVICE.

THE Medical Service of the United States Air Force has been reconstituted since the war, and is described by Colonel A. E. Truby and Major John Dibble of the Medical Corps, U.S. Army, in the *Military Surgeon* for July. The Air Force is organised under the War Department, as is the Air Service, and its chief surgeon, Colonel Truby, is an officer of the Medical Corps. Shortly after the armistice a Director of the Air Service was appointed, who requested the Surgeon-General (Medical Director-General) to transfer the Air Division of the Surgeon-General's office to the Air Service. This was approved and the Medical Division of the Air Service was established, with the Chief Surgeon of the Air Service in charge. The specialised condition of the

Air Service, the work of the flight surgeons, the Medical Research Laboratory at Mineola, N.Y., and the highly technical examination of aviators, explain why the Air Force requires a special medical service not given to cavalry, for example, or artillery. The active flying fields are under the local commands, who are informed that flight surgeons are not available, nor are physical directors, for routine garrison work, except under very special circumstances. The flight surgeon is a selected officer of the Medical Corps, probably a pilot (with 25 per cent. extra pay like all pilots), and so with a complete knowledge of the needs and difficulties of aviators, and thoroughly in sympathy with them. On his recommendation other medical officers will take flying training so as to understudy him if required. He lives with and associates with the aviators constantly; he knows them well and can determine when they should not fly, and what sleep, food, and amenities they should have. He sees, on transfer, all officers who fly or are under flying training. An officer who volunteers for training as an aviator undergoes a very specialised medical examination, with particular attention to stereoscopic vision, field of vision of each eye for form and colour, and latent hypermetropia, which has caused crashes of officers when fatigued. The nervous system undergoes psychological investigation, and defects cannot be waived by examiners, but only by the Surgeon-General of the Army. This examination can only be made by selected officers designated by the Surgeon-General who have been through the examination course at the Medical Research Laboratory. The examination report is in triplicate. One copy remains at the station, and two are sent to the Director of the Air Service for the chief surgeon; of these one with his remarks remains in the Director's office, while the other is returned to the flight surgeon. The Chief Surgeon has a card index of officers, their examinations, crashes, and so on, and is accumulating statistics, which in time will decide the ages for receiving cadets, length of service for pilots, why pilots wear out, who should fly with what planes, and so on. The Chief Surgeon is forming a library, and air ambulances to rescue men who fall in deserts or otherwise out of reach are being devised. He supervises the medical research laboratory, and an "Air Medical Bulletin" is announced. The work of the Medical Service appears to be welcomed by the Air Service; it is certainly of great value to the force, and must prove useful also to general medicine in the United States. We indicate elsewhere the value to civil medicine which has been shown to emanate from the researches of the medical department of our Air Force.

Dr. Philip John Hensley, consulting physician to St. Bartholomew's Hospital and sometime Censor to the Royal College of Physicians, died at Farnham on August 8th in his eighty-second year.

As will be seen in our Parliamentary Intelligence, on the eve of rising for the recess Dr. Addison introduced in the House of Commons a Bill, which was read a first time, embodying a number of far-reaching provisions in regard to housing, hospital accommodation, and the reception of early mental cases. It is proposed to give to all the larger local authorities—those of counties and county boroughs—power to supply and maintain their own general and special hospitals, to make contribution to voluntary hospitals within their areas on terms acceptable to the Ministry of Health, to maintain Poor-law hospitals and infirmaries, and to keep up a local ambulance service for accident and illness.

WEYMOUTH AND DORSET COUNTY ROYAL EYE INFIRMARY.—The annual meeting was recently held at Weymouth. The institution was established in 1836 by Mr. Charles Bridge, and he was the first surgeon to the infirmary. The medical report stated that for the 12 months ended June 30th, 1920, the in-patients admitted were 80, and the out-patients numbered 803. The financial statement showed a favourable balance of £112.

ECONOMIC CONDITIONS IN VIENNA:

THE FATE OF THE UPPER MIDDLE CLASS.

A REPORT written by Marjorie Vernon, a member of the Friends' Relief Mission in Vienna, and issued by the Friends' Emergency and War Victims Relief Committee (27, Chancery-lane, London, W.C. 2), pictures the desperate, and apparently hopeless, position of the educated middle class in that city. Although the report deals with this class as a whole, it may be taken as applying specifically to the members of the Viennese medical profession. The general condition of malnutrition set out constitutes in itself a medical problem.

Numbers Involved.

Of the total population of Vienna, stated as 1,838,708, an undue proportion—namely, about 352,000—are upper middle-class people, and these were made up, according to the census of 1910, in the following way:—

1. Court, State, and other public officials	75,000	
Plus dependents		139,000
2. Teachers, professors, and all those concerned in education	15,000	
Plus dependents		25,000
3. Other professions (lawyers, doctors, artists, &c.)...	15,000	
Plus dependents		29,000
4. Small property owners—people living on investments	52,000	
Plus dependents		106,000
5. People in institutions (orphans, &c.) ... ... People preparing themselves for professions (students, &c.)		43,000
		342,000
6. Present estimate of number of officers in Vienna		10,000
		352,000

And the list is not complete for it does not include bank and other private officials, or any shopkeepers. A considerable number are new-comers without employment, or people who have lost their work and subsist on their pensions.

The Middle-class Balance-sheet: Yearly Budget of a Family in England and Austria Compared.

Articles.	England. Quantities.	Price. £ s. d.	Austria. Quantities.	Price, kronen.
Bread per wk.	... 23 lb.	0 7 0	4 kg.	24*
			8·8 ,, ...	264†
Flour	3 ,,	0 0 7	2 ,, ...	23*
Sugar	2 ,,	0 2 4	15 dekkas	7*
			90 ,, ...	135†
Meat	7 ,,	0 10 0	10 ,, ...	124*
			3 kg.	450†
Potatoes	33 ,,	0 4 6	15 ,, ...	129
Fat	3½ ,,	0 4 6	12 dekkas	14*
			1½ kg.	240†
Jam	4 ,,	0 3 8	2 ,, ...	80†
Oatmeal	2 ,,	0 1 0	1 ,, ...	10†
Vegetables	28 ,,	0 7 0	12·8 ,, ...	128†
Milk	14 qts.	0 14 0	14 litres	140
Cereals	2 lb.	0 1 0	1 kg.	50
Dried beans	1 ,,	0 0 6	½ ,, ...	14
Fish, eggs or rabbit	6 ,,	0 10 0	3 ,, ...	240
Cheese	1 ,,	0 1 6	½ ,, ...	75
Fruit	8 ,,	0 4 0	3½ ,, ...	175
Tea	¼ ,,	0 0 7	⅕ ,, ...	22
Coffee	½ ,,	0 1 0	¼ ,, ...	13
Cocoa	¼ ,,	0 0 10	⅕ ,, ...	22
Boot polish	1 tin	0 0 4	1 tin	13
Soda	1 lb.	0 0 2	½ kg.	4
Soap	1 ,,	0 1 4	½ ,, ...	30
Weekly total		3 15 10	... ...	2,326
Yearly total		197 3 4	... ...	120,952
Coal 10 tons a year		22 10 0	364 kg.	728*
			9636 ,, ...	48,180†
Electric light		6 0 0	... ...	1,560
Firewood		3 0 0	800 ,, ...	800
Trams about 6*d.* a day ...		9 0 0	About 6 k. a day ...	2,190
Repairs to house and clothes		5 0 0		1,000
Rent		50 0 0		1,000
Yearly total		£292 13 4	Yearly total ...	K176,410

* Denotes the rationed quantities.
† Quantities assumed to be smuggled in.

Now, although the wages of the Viennese workers are on an average between 23 and 33 times what they were in 1913, the incomes of the "Mittelstand" have only increased four to eight-fold, while the salaries of pensioners have hardly risen, and the income of people who live on their investments not at all. But on the

expenditure side, the yearly budget of a middle-class family in Vienna, consisting of father, mother, and two children, now compares, as shown in the table given above, with that of a similar family which buys the same things in England at English prices.

The result shows that £292 odd buys the same amount of goods in London as 176,000 kronen will buy in Vienna, and it will be observed that this budget makes no allowance for clothes, rates and taxes, insurance, doctors and dentists, holidays and amusements, education, books and newspapers, wine and tobacco, replacement of furniture, house linen and kitchen utensils, or domestic service. This whole budget, which only includes the bare essentials of life, comes in Vienna to 176,000 kronen. The highest salary, with very few exceptions, which anyone gets, is 96,000 kronen, and this is far in excess of the average.

Typical Examples of Privation.

The report goes on to give concrete instances of the actual lives of representative middle-class folk under this régime. We transcribe two of them.

The man is a Finanzsekretär in the Government service, and before the war he earned 3600 kronen a year. In those days he lived at Krems—a town about three hours journey from Vienna—with his wife and four children, a boy and three girls. He was quite well off, kept a servant, and lived very comfortably. His income has now been raised to 42,000 kronen. On this income he finds it impossible to keep his family together at all. He has left his wife and the little boy in Krems—the eldest girl has got work for which she is paid 12,000 kronen a year. The two little girls of 12 and 14 have been sent to a boarding school which costs him 600 kronen a month. He himself has come to live alone in Vienna in one little room for which he pays 80 kronen a month. These are favourable terms as the landlord happens to be a friend of his. For his midday meal he goes to the Gemeinschaftsküche (it corresponds to our war-time national kitchen), where he pays only 7 kronen for his meal and gets soup, vegetables, and a mehlspeise, which corresponds to our pudding. Nowadays in Vienna a mehlspeise is often just a piece of slightly sweet bread or perhaps cooked tapioca with cinnamon and sugar sprinkled over it. These Gemeinschafts- and Kriegsküchen are depressing places; sometimes they are underground, always they are dismal. You see long tables covered with dirty table-cloths at which rows of shabby disheartened people sit, silently lapping up watery soup or stodging through mounds of potatoes and vegetable marrows. One aluminium spoon and fork suffices for the whole meal. In the evening, however, our friend the Finanzsekretär has to go to a restaurant, as the kitchen is closed. There he will find it hard to dine under about 20 or 25 kronen, and if he wants any meat he will have to pay about 40 kronen more. To add to his troubles his little girls are both unwell—one has had pleurisy, and the other child has to see an oculist—all causes of additional expense.

A man of 31, who is an assistant lecturer on Eastern European languages and history at the University. He has a wife and one child of 8, and his salary is 21,600 kronen a year. He pays 720 kronen in rent and 480 for light a year. The whole family go to the Gemeinschaftsküche for their midday meal, which costs them 9 kronen each. The child is very delicate and underfed, although the parents make tremendous sacrifices to buy her three or four tins of condensed milk each week. Each tin has to be smuggled in and costs 50 kronen. Professors' salaries, of course, vary considerably, but in no case do they ever approximate to a real living wage. I have before me a list of some half dozen professors—personally known, but quite average cases. Here are two samples: A professor of a university, 53 years old, with a wife and two children—his total salary is 20,000 kronen a year. An assistant professor, 58 years old, with a wife and three children—his total salary is 19,690 kronen a year; and one could quote such cases indefinitely. There is, however, a further tragedy involved for these professors. They have not enough to eat; they cannot clothe themselves or their families properly; but besides this they cannot even pursue their work without being held up at every point. All printing, for instance, has gone up by at least 2000 per cent. in the last year or so. Then the interchange of scientific papers and magazines between the professors and universities of different countries has practically ceased. For even were the countries willing, Austria, even in this sphere, has very little to give. Scientific research, again, is only persevered in against fearful odds. The prices of things needed for an ordinary chemical laboratory have risen by about 4000 per cent. Ordinary drugs and chemicals are anything from 40 to 100 times as dear as before the war. There was a little while ago an almost comically pathetic article in a newspaper by a doctor engaged in research work. He wrote most despondently about the terrible cost of rabbits and guinea-pigs—essential for research work—and lamented bitterly that people nowadays eat them in such vast quantities as to make them almost worth their weight in gold. The letter made one smile, yet it revealed the hopeless blank which faces people here whichever way they turn. They are hungry and cold and turn to their work for help, and there the same spectre of despair faces them again.

The Health of School Children.

The net result of all this suffering is practically impossible to get in figures, which apply only to the middle class. Mrs. Vernon has only been able to get one set of figures where the middle class can be picked out and compared with the working class. There is now going on in Vienna a medical examination of all school children under 14 years of age. This examination is specially an inquiry into underfeeding and anæmia. The children are divided into three classes, the first class being the best and the third the worst fed. Vienna is divided into districts and the results in each district are grouped together. In the following table four middle-class districts are compared with three working-class districts :—

A. Middle-class districts—number examined 9308.

	% children in		
	Class I.	Class II.	Class III.
1	38·4	15·2	46·4
2	25·4	53·3	21·3
3	18·0	45·6	36·4
4	11·8	20·6	67·6
Average	23·4	33·7	42·9

B. Working-class districts—number examined 41,194.

	% children in		
	Class I.	Class II.	Class III.
1	14·4	38·3	47·3
2	47·2	26·4	26·4
3	19·5	34·0	46·5
Average	27·0	32·9	40·0

It will be seen that the middle-class districts show slightly worse results than the working-class districts. Mrs. Vernon went with the school doctor to see the medical examination in progress, and reports :—

We first went to a school which is situated in one of the healthiest districts of Vienna. This district is chiefly inhabited by middle-class people, it is almost outside the town and lies very high. The air is fresh and pure, and in normal times the children are particularly healthy. Later we visited a school where the children come almost entirely from working-class homes. The district has the reputation of being one of the worst in Vienna—it lies low, the houses are more crowded together, the people more ignorant. And yet one undoubtedly got the general impression that the children in the middle-class school were worse developed, were whiter and thinner than those in the working-class school. The school doctor also bore this out, and it really does appear to be true. When one thinks of all the advantages which middle-class children have—the air space first and then the intelligence in buying food, the care and thought, the cleanliness, everything in the child's favour—these facts and figures are rather striking.

Can and Should Relief be Attempted?

In concluding the report Mrs. Vernon raises the question whether middle-class relief is a right thing to undertake at all. Some may feel that in a country where the barest necessities of life are unprovided for, where for many years to come no one will have money to spend on anything but bread and butter, a cultured middle-class does not stand a chance of surviving, and that to keep it alive is merely to foster an artificial state of society which, if left alone, would readjust itself and reach a position of stable equilibrium more quickly, and therefore ultimately with less suffering, than if relief agencies intervened. She answers her question with another :—

"When, however, the next generation grows up, what will it say if we have saved the men who worked to feed and clothe humanity, but allowed those to die whose work was to keep civilisation alive? In Vienna, especially, the professors, doctors, artists, musicians, and sculptors have a claim which cannot be denied."

How the apparently impossible is to be achieved and the upper middle class in Vienna, including the doctors, is to be saved, upon this the report does not enter. The facts are recorded without minimising or exaggerating their significance.

MEDICINE AND THE LAW.

Godman v. *Maclean.*

IN this action the patient sued a medical man for damages for alleged negligence in the use of cocaine. The drug was employed as a local anæsthetic in operating on a small cyst of the hand, a 5 per cent. solution combined with adrenalin being injected. After the injection of 5 minims it was found that the requisite anæsthesia had not been produced, and a further injection of 5 minims was made when alarming symptoms followed. An illness lasting 3½ years, from which the patient had only partially recovered, was ascribed by the plaintiff to the effects of the cocaine, and this was apparently not in dispute. The only question, indeed, for Mr. Justice Salter who tried the case was that of the alleged negligence. The negligence, his lordship said, was alleged in three ways: (1) That it was negligent to use cocaine for hypodermic injection at all; (2) that too large or too strong a dose was administered; (3) that there was unskilfulness and carelessness in the actual administration of the second injection. It was contended that cocaine as used was obsolete, and known to be obsolete and dangerous. As to this, his lordship understood from the evidence before him that the risk was practically confined to persons abnormally sensitive to the drug, a peculiarity of the patient not discoverable beforehand. With regard to the danger of using cocaine the relative merits of other drugs for the same purpose and the correct dosage he was satisfied from the evidence called on both sides that the highest medical opinion was not in agreement. He had the evidence of chemists and of pharmacists that cocaine was still widely used, and that although the proportion prescribed was frequently less than 5 per cent., that proportion was used if the strength was not mentioned because it was the strength prescribed in the British Pharmacopœia. In fact, cocaine was included in the British Pharmacopœia for the purpose and in the proportions in which the defendant had used it, and he had the evidence of the defendant as to his own experience in the employment of the drug. A medical man could not be convicted of negligence for having administered a preparation agreeing both in strength and amount with the British Pharmacopœia, and of which, moreover, he had had satisfactory experience for many years. As to the suggestion that a small vein had been pierced in making the second injection, even if this had been so there evidence before him that it was possible to inject cocaine into a small or even into a larger vein without danger to a normal person, such as evidence showed the plaintiff apparently to be.

In giving judgment for the defendant his lordship expressed deep sympathy with the plaintiff. Costs were not asked for on behalf of the defendant, and a counter claim was not pressed, the plaintiff's counsel expressing her thanks to the defendant for his attitude in this. The defendant and the London and Counties Medical Protection Society, who supported him, are to be congratulated upon the conclusion of a professional experience which must have caused the former considerable distress and anxiety.

Hypnotism and the Law.

It is sometimes made a subject of unfavourable comment that there is no specific legal provision in the United Kingdom against the abuse of hypnotism by unscrupulous persons, and the reviews of a recent book have called attention to the position. The existence of a danger of this kind appears to be recognised in some other countries. In Belgium, at any rate, it has for many years been illegal to hypnotise, or cause to be hypnotised, any person by way of public exhibition. In a similar manner penalties of fine and imprisonment may there be imposed on anyone who, not being a medical practitioner or the holder of a Government licence for the purpose, hypnotises a person who is under 21 years of age or is of weak mind. A penalty also is provided for anyone who, with the intent to defraud or to injure anyone, causes a hypnotised subject to write or sign any document embodying an obligation. Any person uttering or making use of any document so obtained is equally punishable. Whereas, however, hypnotism might be made the subject of legislation in this country by way of precaution and in order to deter possible evil-doers, it has not been found apparently that public exhibitions of hypnotism have been a serious source of danger to the public, or that the control exercised by the hypnotiser has been made use of for criminal purposes in any manner with which the existing law cannot deal. Probably with us the most serious danger to the public lies in the freedom of the quack to exploit hypnotism for alleged therapeutic purposes; and the most useful and effective way to protect the ignorant from being imposed upon, and the public generally, would be to forbid the exercise of hypnotism for any purpose except by, or under the control of, a medical practitioner. Meanwhile, none but foolish persons will trifle with hypnotism or invoke its aid except under medical advice.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Authority of the Local Government Board in Ireland.

IN many parts of Ireland the authority of the Local Government Board is being flouted. At a meeting of the Cavan board of guardians an order has been made that no books or documents be produced for inspection of auditor or other official of the Local Government Board, and that minutes of its proceedings be sent to Dail Eireann (the governing body of Sinn Fein). The clerk pointed out that the grants received by the board of guardians totalled £3262, and by the district council £3032. It was explained that (in accordance with the recent circular of the Local Government Board) these grants would soon be stopped. Co. Cavan Council also has ordered that in future minutes and correspondence be sent to Dail Eireann only, and a special committee was appointed to consider the financial position that might be created by the withdrawal of grants made by the Treasury. The Cavan board of guardians has decided that policemen's wives holding positions as district nurses under the board should be called upon to resign. The Finance Committee of the Donegal County Council has decided to refuse payment of a sum of £14 14*s.* 11*d.* for medical and nursing expenses incurred in connexion with police injured near Dungloe on Dec. 12th, 1919. The money was paid to the infirmary authorities, and the Lords Justices have certified for its payment as mentioned in a letter sent by the under-secretary of the Lord-Lieutenant to the Donegal County Council, and requesting that an order payable to the under-secretary be returned by the council at an early date.

The Irish Public Health Council's Report.

Although the report of the Irish Public Health Council was issued almost two months ago, no public action on it has so far been taken by the medical profession. Whether, indeed, any legislation will follow is extremely doubtful, for if the present Home Rule Bill becomes law, it is probable that it will be left to Ireland itself, or to the two parts of Ireland involved, to carry out whatever measures they like. It is believed that local medical committees will be soon asked, in various places, to discuss the report and to instruct delegates to represent their views at a meeting of the medical profession, to be subsequently held in Dublin, as to whether the report is to be accepted or not, or modified before its acceptance.

Vital Statistics.

Some interesting statistics are found in the return of the Registrar-General for the first quarter of 1920. The birth-rate for the quarter—23·9 in every 1000 of the estimated population of Ireland (4,470,000 for 1920)—is 1·7 above the average rate for the corresponding quarter of the ten years 1910–1919, and 3·9 above the rate for

the first quarter of 1919. The death-rate (16·9 per 1000) is 8·8 below the rate for the same quarter in 1919, and 4·3 below the average for the first quarter of the ten years 1910–1919. Curiously the returns of pauperism show an increase of 320 in the average number of workhouse inmates, and an increase of 784 in the average number of persons in outdoor relief, and this at a time when wages in every department of industrial life never were so high. The marriages registered in Ireland in 1919 were 26,977, and oddly, the largest number, 7241, were registered in the third quarter (July–September). Of the deaths registered in the first quarter of 1920 (there were in all 18,882) epidemic diseases caused 974 (0·87 per 1000 living), being 0·14 above the average for the first quarter of the five preceding years. Whooping-cough comes first, with 279 deaths, then measles with 208, diarrhœa with 159, diphtheria with 133, scarlet fever with 129, enteric with 54, dysentery with 9, and typhus with 3. There were in the quarter under review 2023 deaths from all forms of tuberculosis, equal to an annual rate of 1·81 per 1000 of the Irish population, while the deaths of infants under one year old are equal to 90 per 1000 births.

August 16th.

Public Health.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE HEALTH OF LURGAN (ULSTER).

IN a country where "sanitary matters are at least 30 years behind the state of administration in the rest of the United Kingdom" it is pleasant to come across a record of such admirable work as is contained in the interesting report of Dr. Samuel Agnew, the medical superintendent officer of health of Lurgan urban sanitary district, for the year 1919. During the time that he has been officially connected with Lurgan (40 years) lanes and courts have been abolished, all dwelling-houses have been provided with separate conveniences and tiled yards, and a public water-supply installed since 1895. This water is pumped up from Lough Neagh to filtering beds and then conveyed to Lurgan. At one time, acting on expert authority, Belfast declined to take water from Lough Neagh, but the advice has since been proved to be wrong by the practical experience of Lurgan—one of Ulster's most progressive industrial towns—where, since 1895, when the Lough Neagh supply was begun, no epidemic usually ascribed to impure water-supply has occurred. In 1919 the average death-rate in Lurgan was 16·5, the birth-rate 22·0, and the infantile mortality was only 52 per 1000 births, and there was not a single death from small-pox, typhus, enteric, scarlet fever, diphtheria, measles, or whooping-cough. Dr. Agnew expresses grave disappointment with the working of the Tuberculosis (Prevention) Act. Formerly the prescribed conditions relating to the notification of tuberculosis, applied only to the pulmonary type, were that the persons to be so notified must be habitually sleeping or working in the same room as other persons or employed in the preparation and distribution of articles of human food intended for sale to the public. An amended Order was issued last year by the Local Government Board by which notification—in Ireland—applies in every case in which a person, not being at the time in receipt of institutional or other treatment under an approved scheme for the treatment of tuberculosis, is suffering from tuberculosis of any form at any stage in which the sputum or other infective discharge of, or from, such person is, in the opinion of the medical practitioner attending such person, liable to communicate the disease to other persons. The objection even to this improved form of notification is that in most cases the disease has so far advanced (to fulfil the conditions) that notification is too late and that nothing at all is being done to prevent the bovine form of the disease. In Ireland hardly anything is being accomplished in the prevention of tuberculosis, sometimes called the "Irish disease," now, just as typhus was in former times. An admirable maternal and child-welfare scheme, with pre-natal department, is in active work in Lurgan, which is really one of the most advanced public health towns in Ireland.

SCHOOL MEDICAL INSPECTION.

BIRMINGHAM.

The number of children on the school registers in Birmingham (December, 1919) was 153,648, and the total number examined at the routine inspections during the year was 40,515; the total number of cases treated at the various clinics was 50,853. The percentage of defects treated was 69·5. Analysis of the cases of defective vision treated by Dr. R. Beatson Hird shows that out of 723 fresh cases examined 595 were found to require glasses. Of these, 73·3 per cent. were cases of hypermetropia (160) or hypermetropic astigmatism (277), and 26·4 per cent. were cases of myopia (51), myopic astigmatism (71), or mixed astigmatism (36); that is, astigmatism in one form or another accounted for 64·4 per cent. of all the cases of visual defect.

Convergent squint.—Dr. A. W. Aldridge, who also treated eye cases, emphasises the importance of very early treatment—"within a month of first attendance at school." Neglect or delay in treatment leads to permanent disturbance of vision, as the squinting eye is not used. By placing a pad of wash-leather over the good eye (two layers of wash-leather a little larger than the frame of the spectacles, so that the glass is covered by it on each side like a muff, the wash-leather being stitched round the glass), the squinting eye is made to do its work.

"When the sight in each eye is practically equal (usually after three or six months) the shade is worn on alternate eyes, and after the lapse of another year the vision in each eye will often be about 6/9, with an alternating squint."

In favourable cases this will entirely disappear, but the shading must be continued for an hour or two each day for a long time after apparent cure, as relapses are still apt to occur.

Tonsils and adenoids.—There was considerable increase in the number of children operated on for these—1429 compared with 1021 in the previous year; moreover, the waiting list of children needing treatment at the end of the year represented nearly a whole year's operations.

"These figures give cause for thought and inquiry. Either the tonsils (including the tonsillar tissue, enlargement of which is known as 'adenoids') have a definite physiological function, with which we interfere at a certain cost to the organism, or the enlargement is a reaction against some morbid cause. ..... There is little doubt that the enlargement of these tissues is, in fact, due to an infective process, spread like other infections, possibly as a result of the aggregation into schools."

Open-air conditions are indicated.

Ringworm has been treated by means of X rays with great success; in 1911 the cases of ringworm were estimated to be as many as 1400; in 1912 and 1913 the numbers of cases known to exist were 2281 and 2131 respectively; at the end of 1919 the total number awaiting examination and treatment was only 37. This very satisfactory result is due entirely to the introduction of X ray treatment, and in not a single case have any permanent patches of baldness been left.

Tuberculosis shows an improvement in 1919 over the preceding years, not only those of the war period (when the incidence "was probably a reflex of the lowered health margin due to war conditions"). The notified cases among children up to 15 years of age, which were 732 in 1913 and 918 in 1916, have fallen to 844 in 1917, 716 in 1918, and 588 in 1919. Open-air treatment is carried out at the Yardley-road Sanatorium.

Influenza is said to have "caused a heavy mortality amongst the child population of the city." No details are furnished, and the number of deaths (among children of school age, 5 to 15) is stated as 42, compared with 223 in the previous year (p. 35); on p. 21 the deaths in 1918 between 5 and 15 years of age are stated as 357.

Open-air teaching is carried out to a considerable extent by means of an open-air school at Uffculme, a

"roof-class" at St. Thomas's and St. Alban's, and playground classes at several schools.

Disinfecting apparatus.—The need here is great. It is to be regretted that 35 per cent. of all the children examined showed the presence of vermin; some improvement, however, has been effected, as 64·81 per cent. were found to be "clean," compared with 56·6 per cent. in 1915. Scabies has increased in prevalence (1202 cases treated, compared with 603 in 1917). This has been largely due (as elsewhere) to return of infected soldiers from active service. Unfortunately, only one of the clinics is provided with a disinfecting apparatus; accordingly the children in many cases have to put on infected clothing after being bathed. The need for increased facilities for disinfecting clothing is obvious. Birmingham, according to the last census (1911), ranks as the largest city in England after the metropolis, and when once the urgency of this requirement is recognised there can be no doubt that the deficiency will be made good.

BRISTOL.

In his report to the Bristol Education Committee for 1919 Dr. R. A. Askins, the school medical officer, draws attention to the fact that "one of the lessons of the war has been the realisation of the large amount of physical unfitness in adults due to want of care and treatment during childhood, and consequently a powerful incentive has been given to improve and enlarge a work which has for its object the raising of the standard of health of those children who are to form the future of the race." The full scheme of medical inspection has been again brought into action, and both the central clinic and that at Bedminster have been reorganised and the work extended. The importance of the help given by head teachers, as Dr. Askins remarks, cannot be overestimated, and they, in return, recognise the help given them by the school medical officer in regard to absentees, &c. Reference is also made to the valuable work of the school attendance department: a large number of refractory cases are interviewed personally by the superintendents, who seldom fail to secure the compliance of the parents. In this way the school authority is often spared the trouble and unpleasantness of undertaking a prosecution for non-attendance. The full scheme of inspection in detail has been resumed since April, 1919, the total number examined in the code groups of entrants, 8-year-old children, and leavers being 19,374; besides which there were 5696 specially examined.

Defects requiring treatment that bulked most largely in the routine examinations (code groups) were as usual teeth and throat cases, 1360 of the former and 1223 of the latter, in addition to 253 and 69 respectively needing to be kept under observation. Malnutrition was considered to need treatment only in 29 children out of the whole 19,374 in the code groups, and only eight others were specially brought forward as needing care on this account. No evidence of physical deterioration in the young, due to the special economic circumstances of the times, can be gathered from these statistics. Organic heart disease was diagnosed in 113 children, and definite tuberculosis only in 25, though its presence was suspected in 125 others. Three inspection clinics are held in the city, where special cases are sent by head teachers, nurses, and attendance officers. Of the 4622 children who were treated more than half (2444) were cases of skin disease (ringworm, impetigo, scabies, and vermin), compared with 1892 in the previous year.

"One is horrified at the high percentage of girls with lice in their hair. ..... The condition is so common that parents still regard it but lightly, and one of the first things necessary is to teach the girls themselves how serious the matter is."

It is also stated that the condition is much more common among secondary school girls than had been expected. Ringworm of the scalp was found to exist in 427 children, causing absence from school on an average for 24·2 weeks, or roughly six months. Treatment by X rays is being arranged for. Scabies (517) and impetigo (948) were also prevalent. Arrangements for treating the former disease are being made by the provision of a bathroom at one of the clinics; it is, however, undesirable that children with this complaint should be mixed up with other children at an ordinary clinic; a separate clinic with suitable bath accommodation is much to be preferred.

Referring to tuberculosis Dr. C. J. Campbell Faill reports that—

"a much larger proportion of the juvenile population is infected than had previously been suspected. There is no reason why the great majority of these children should not eventually grow up into healthy men and women. All that is required is a little knowledge and a great deal of care."

They are often exceptionally bright and intelligent. There are two open-air schools in use, but more accommodation of this kind is required, and open-air classes in the public parks are recommended. Bristol stands sixth (after the Metropolis) in regard to population among the cities of England and Wales, and appears to be carrying out with thoroughness and efficiency its aim of "raising the standard of health of those children who are to form the future of the race."

BRIGHTON.

At Brighton the health of the 3996 school children who were medically examined in full detail during 1919 was found to be, on the whole, satisfactory. Dr. Duncan Forbes, the school medical officer, gives a useful table in his annual report of the relation of weight to height as a means of estimating nutrition.

"A child who is not up to proper weight for a certain height is more in need of feeding than is the child below *both* weight and height standard for its age, but of an average height-weight ratio; the latter child is well nourished, and its deficiency in general physique—i.e., its small size—is often due to other causes than improper or insufficient food."

This is perhaps not always recognised. The anthropometric measurements, when compared with those tabulated by Mr. Arthur Greenwood[1] in 1913, are not quite what one would expect to find; the average weight of the 1990 boys was below that of boys in elementary schools in England and Wales generally at each year of age from 3 to 15, except at 5 and 9, when it was above, and at 7 and 10, when it was equal to the average. Among girls the average weight of 2006 was above the general average at 8, 9, 10, 11, and 14; at the other ages it was below the average. On the other hand, the average height was less than that of school children in England and Wales generally only among boys of 3 years and girls of 5 and 8 years; at all other ages the heights were equal to or greater than the general average. The health of the school children generally was satisfactory. Among the 3996 children examined in detail the most numerous defects found were those of vision (151) and throat (tonsils and adenoids 269); no actual tuberculosis of the lung was detected, but 14 children were kept under observation on this account.

URBAN VITAL STATISTICS.

(Week ended August 14th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·8, 9·9, and 9·6 in the three preceding weeks, fell to 9·4 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate did not exceed 8·5, or 0·6 per 1000 below that recorded in the previous week, while among the remaining towns the rates ranged from 3·9 in Dudley, 4·4 in Hornsey, and 5·1 in Coventry, to 15·2 in Oldham and in Aberdare, 16·1 in Barnsley, and 17·3 in South Shields. The principal epidemic diseases caused 177 deaths, which corresponded to an annual rate of 0·5 per 1000, and comprised 93 from infantile diarrhœa, 40 from diphtheria 21 from measles, 12 from whooping-cough, 8 from scarlet fever, and 3 from enteric fever. Measles caused a death-rate of 2·2 in Merthyr Tydfil, but the mortality from the remaining diseases showed no marked excess in any of the towns. There were 2106 cases of scarlet fever and 1413 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2027 and 1469 respectively at the end of the previous week. The causes of 30 of the 3226 deaths in the 96 towns were uncertified, of which 7 were registered in Birmingham and 3 each in Coventry, Liverpool, and Barrow-in-Furness.

[1] Health and Physique of School Children, 1913.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 11·6, 11·2, and 11·1 in the three preceding weeks, rose to 12·3 per 1000. The 297 deaths in Glasgow corresponded to an annual rate of 13·9 per 1000, and included 17 from infantile diarrhœa, 7 from whooping-cough, 5 from small-pox, 2 each from measles and scarlet fever, and 1 from diphtheria. The 74 deaths in Edinburgh were equal to a rate of 11·3 per 1000, but included no death from any of the principal epidemic diseases.

Irish Towns.—The 104 deaths in Dublin corresponded to an annual rate of 13·1, or 0·3 per 1000 below that recorded in the previous week, and included 3 from infantile diarrhœa and 2 from diphtheria. The 107 deaths in Belfast were equal to an annual rate of 13·5 per 1000, and included 2 each from enteric fever and infantile diarrhœa, and 1 from measles.

VITAL STATISTICS OF LONDON DURING JULY, 1920.

IN the accompanying table will be found summarised statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious disease, it appears that the number of persons reported to be suffering from one or other of the ten diseases notified in the table was equal to an annual rate of 6·5 per 1000 of the population, estimated at 4,358,309 persons; in the three preceding months the rates had been 6·7, 6·3, and 6·0 per 1000. Among the metropolitan boroughs the lowest rates from these diseases last month were recorded in Chelsea, the City of Westminster, Hampstead, Holborn, the City of London, and Camberwell; and the highest in Fulham, Finsbury, Bethnal Green, Stepney, and Greenwich. The prevalence of scarlet fever was somewhat greater than in the preceding month; this disease was proportionally most prevalent in Fulham, Bethnal Green, Stepney, Bermondsey, and Greenwich. The Metropolitan Asylums Hospitals contained 1940 scarlet fever patients at the end of the month, against 1795, 1671, and 1674 at the end of the three preceding months; the weekly admissions averaged 284, against 223, 228, and 251 in the three preceding months. Diphtheria was slightly less prevalent than in June; the greatest prevalence of this disease was recorded in Paddington, Fulham, Shoreditch, Bethnal Green, Poplar, and Battersea. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1937, 1783, and 1590 at the end of the three preceding months, further fell to 1470 at the end of July; the weekly admissions averaged 179, against 221, 214, and 189 in the three preceding months. The prevalence of enteric fever was considerably higher than in the preceding month; of the 43 cases notified during the month 6 belonged to Kensington, 6 to St. Marylebone, 4 to Fulham, 3 to Islington, and 3 to Lewisham. There were 24 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 29, 18, and 19 at the end of the three preceding months; the weekly admissions averaged 6, against 4, 3, and 3 in the three preceding months. Erysipelas was proportionally most prevalent in St. Marylebone, Hampstead, Holborn, Finsbury, Bethnal Green, and Southwark. The 10 cases of cerebro-spinal meningitis included 2 in Wandsworth, while of the 7 cases of poliomyelitis 2 belonged to Lambeth.

The mortality statistics in the table relate to the deaths of civilians actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the four weeks ended July 31st the deaths of 3203 London residents were registered, equal to an annual rate of 9·6 per 1000; in the three preceding months the rates had been 15·4, 12·4, and 10·3 per 1000. The death-rates ranged from 6·8 in Hampstead, 7·7 in Fulham, 7·8 in Hammersmith, 7·8 in Woolwich, 8·4 in the City of London, and 8·4 in Wandsworth, to 11·2 in Chelsea, 11·4 in Bermondsey, 11·5 in Poplar, and 11·6 in Shoreditch, in Bethnal Green, and in Stepney. The 3203 deaths from all causes included 192 which were referred to the principal infectious diseases; of these, 34 resulted from measles, 9 from scarlet fever, 44 from diphtheria, 18 from whooping-cough, 4 from enteric fever, and 83 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded last month in Holborn or in the City of London. Among the metropolitan boroughs the lowest death-rates from these diseases were recorded in Hammersmith, Fulham, Hampstead, and Greenwich; and the highest in Kensington, Stoke Newington, and Deptford. The 34 deaths from scarlet fever were 37 below the average in the corresponding period of the five preceding years; this disease was proportionally most prevalent in Kensington, Hammersmith, Hackney, Stepney, Poplar, and Battersea. The 9 fatal cases of scarlet fever were 5 fewer than the

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JULY, 1920.

(*Specially compiled for* THE LANCET.)

Cities and Boroughs.	Estimated civil population, 1919.	Notified Cases of Infectious Disease.												Deaths from Principal Infectious Diseases.								Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,358,309	—	1168	747	—	43	—	29	172	10	7	2176	6·5	—	34	9	44	18	4	83	192	0·6	3203	9·6
West Districts:																								
Paddington	143,938	—	27	33	—	2	—	—	5	—	1	68	6·2	—	1	—	2	—	—	3	6	0·5	104	9·4
Kensington	157,886	—	47	16	—	6	—	1	1	1	—	72	5·9	—	3	—	2	1	—	5	11	0·9	124	10·2
Hammersmith ...	130,981	—	28	20	—	—	—	2	3	—	—	53	5·3	—	2	—	1	—	—	—	3	0·3	78	7·8
Fulham	152,543	—	52	48	—	4	—	2	6	1	—	113	9·7	—	—	—	1	—	—	—	1	0·1	90	7·7
Chelsea	60,573	—	6	4	—	1	—	—	—	—	—	11	2·4	—	—	—	1	—	—	1	2	0·4	52	11·2
City of Westminst'r	127,533	—	30	9	—	1	—	—	4	—	—	44	4·5	—	1	—	1	—	—	2	4	0·4	86	8·8
North Districts:																								
St. Marylebone ...	97,953	—	23	5	—	6	—	1	5	1	—	41	5·5	—	1	1	—	1	—	1	4	0·5	81	10·8
Hampstead	88,012	—	11	4	—	1	—	—	5	—	1	22	3·3	—	—	—	—	—	—	2	2	0·3	46	6·8
St. Pancras	219,434	—	51	35	—	—	—	1	11	—	—	98	5·8	—	2	1	2	1	—	6	12	0·7	155	9·2
Islington	323,034	—	76	67	—	3	—	3	9	—	—	158	6·4	—	4	—	3	—	—	4	11	0·4	239	9·6
Stoke Newington...	50,954	—	11	9	—	1	—	1	1	—	—	23	5·9	—	—	—	3	—	—	2	5	1·3	39	10·0
Hackney	216,736	—	64	23	—	—	—	1	4	—	—	92	5·5	—	3	—	2	1	—	5	11	0·7	159	9·6
Central Districts:																								
Holborn	38,156	—	4	3	—	2	—	—	2	—	1	12	4·1	—	—	—	—	—	—	—	—	—	28	9·6
Finsbury...	75,291	—	19	11	—	1	—	1	19	—	—	51	8·8	—	—	—	—	—	—	3	3	0·5	56	9·7
City of London ...	13,893	—	2	1	—	—	—	—	—	—	—	3	2·8	—	—	—	—	—	—	—	—	—	9	8·4
East Districts:																								
Shoreditch	98,134	—	19	22	—	1	—	2	5	—	1	50	6·6	—	—	—	—	—	—	5	5	0·7	87	11·6
Bethnal Green ...	110,085	—	64	41	—	—	—	—	9	—	—	114	13·5	—	—	1	—	—	—	6	7	0·8	98	11·6
Stepney	232,506	—	156	34	—	—	—	1	12	1	—	204	11·4	—	3	1	1	2	—	8	15	0·8	207	11·6
Poplar	153,644	—	36	37	—	1	—	—	4	1	—	79	6·7	—	2	1	2	1	—	3	9	0·8	136	11·5
South Districts:																								
Southwark	179,971	—	40	32	—	—	—	2	12	—	—	86	6·2	—	2	—	3	1	1	4	11	0·8	146	10·6
Bermondsey	124,239	—	43	17	—	—	—	1	3	1	—	65	6·8	—	1	—	1	1	—	3	6	0·6	109	11·4
Lambeth...	282,322	—	84	46	—	1	—	—	6	—	2	139	6·4	—	1	1	4	1	—	2	9	0·4	189	8·7
Battersea	159,316	—	31	40	—	—	—	4	1	1	1	78	6·4	—	3	1	2	2	—	2	10	0·8	115	9·4
Wandsworth... ...	333,693	—	63	70	—	2	—	2	11	2	—	150	5·9	—	2	1	1	1	—	5	10	0·4	215	8·4
Camberwell	273,802	—	49	37	—	2	—	1	14	—	—	103	4·9	—	1	—	4	2	1	5	13	0·6	203	9·7
Deptford...	111,205	—	29	23	—	2	—	—	3	—	—	57	6·7	—	1	—	4	1	2	2	10	1·2	81	9·5
Greenwich	98,484	—	33	17	—	2	—	—	5	—	—	57	7·5	—	1	—	—	—	—	—	1	0·1	72	9·5
Lewisham	167,754	—	42	17	—	3	—	2	6	1	—	71	5·5	—	—	1	3	—	—	3	7	0·5	117	9·1
Woolwich	136,237	—	28	26	—	1	—	1	6	—	—	62	5·9	—	—	—	1	2	—	1	4	0·4	82	7·8
Port of London ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

average. The 44 deaths from diphtheria exceeded the average by 6; the greatest proportional mortality from this disease occurred in Chelsea, Stoke Newington, Southwark, Deptford, and Lewisham. The 18 fatal cases of whooping-cough were 31 below the average; of these deaths, 2 belonged to each of the boroughs of Stepney, Battersea, Wandsworth, and Woolwich. Four deaths from enteric fever were registered during the month, against an average of 7; of these deaths, 2 belonged to Deptford. The 83 fatal cases of infantile diarrhœa were 23 in excess of the average; the greatest proportional mortality from this disease occurred in Kensington, Stoke Newington, Finsbury, Shoreditch, Bethnal Green, and Stepney. In conclusion, it may be stated that the aggregate mortality in London during July from these principal infectious diseases was 19·7 per cent. below the average in the corresponding period of the five preceding years.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Cmdr. C. H. Rock is placed on the retired list at own request.

Surg. Lieut.-Cmdr. E. St. G. S. Goodwin is appointed to the *Blake*.

ROYAL ARMY MEDICAL CORPS.

Major and Brevet Lieut.-Col. H. J. Crossley relinquishes the acting rank of Lieutenant-Colonel.

Capt. J. R. Hayman, from Spec. Res., to be Captain.

Temp. Capts. W. D. Arthur, E. J. Mannix, to be Captains.

The undermentioned late Captains, R.A.M.C., Spec. Res., to be temporary Captains: D. B. Robertson, H. A. Hill, W. H. Simmons, D. E. Hearn.

Temp. Capt. M. J. Whelton to be Lieutenant and to be temporary Captain.

Officers relinquishing their commissions:—Temp. Lieut.-Col. J. R. Lord (on ceasing to serve with the Horton War Hospital, and retains the rank of Lieutenant-Colonel); Temp. Capt. W. L. English. Temporary Captains retaining the rank of Captain: J. T. Bleasdell, R. J. Aherne, C. E. Hibbard, L. H. Woods, D. Mitchell.

Overseas Force.

S. T. Mackay and V. B. Ditcham relinquish their commissions on ceasing to be employed as Dental Surgeons and retain the rank of Captain.

TERRITORIAL FORCE.

Major J. W. Bird and Capt. H. Seddon resign their commissions and are granted the rank of Lieutenant-Colonel.

Capts. R. Armstrong and R. C. Neill resign their commissions and are granted the rank of Major.

Capts. A. H. Brewer, A. C. C. Lawrence, and C. C. Lavington resign their commissions and retain the rank of Captain.

1st London General Hospital: Capt. W. B. Ainger resigns his commission and retains the rank of Captain.

TERRITORIAL FORCE RESERVE.

Major C. B. Whitehead, from General List, to be Major.

Capt. W. F. Munro to be Major.

Lieut. H. C. Mee, from North Midland Divisional Train, to be Lieutenant.

ROYAL AIR FORCE.

Flight Lieut. J. H. Porter (Medical) is granted a permanent commission in the rank stated.

INDIAN MEDICAL SERVICE.

The King has approved the grant of the honorary rank of Lieutenant-Colonel in the Indian Medical Service to Dr. Suresh Prasad Sarbadhikari.

The King has approved the retirement of Lieut.-Cols. E. A. W. Hall, F. W. Gee, and W. D. Hayward.

Captains to be temporary Majors: A. F. Babonau, W. M. Lupton, J. B. Lapsley, J. C. Bharucha.

The King has approved the relinquishment of temporary rank by Temp. Capts. Sailendra Nath Chandra and Surapati Ghosh.

PRESENTATION TO DR. W. L. H. DUCKWORTH.—Last week the large theatre of the Cambridge School of Anatomy was the scene of an interesting presentation to Mr. W. L. H. Duckworth, M.A., M.D., D.Sc., senior demonstrator in anatomy, on the completion of 21 years of devoted service to the University as lecturer in physical anthropology. This tribute to the esteem and affection in which he is held was the spontaneous desire of every demonstrator, assistant, and student to contribute to some token of their appreciation of their chief's unfailing courtesy and sympathy, which have made him one of the most approachable and popular of teachers. The presentation took the form of an inscribed silver salver, and was handed to Dr. Duckworth, together with a book containing the signatures of 220 subscribers, by Dr. D. Reid on August 13th in the presence of the staff and students of the anatomy department. In addition to his brilliant academic qualities Dr. Duckworth has shown great capacity for organisation, especially during the past year, when the chair of anatomy has been vacant and the entire control of the anatomy department has devolved upon him.

Correspondence.

"Audi alteram partem."

THE TEST FOR OCCULT BLOOD IN THE STOOLS.

To the Editor of THE LANCET.

SIR,—The examination of the stools for occult blood has always the disquieting accompaniment that although a negative result is unequivocal evidence of the absence of blood throughout the alimentary tract, a positive result, especially a comparatively feeble one, introduces the doubt whether an ulcerated lesion of the stomach or intestine is actually present or whether the result may not be due to the fortuitous introduction of hæmoglobin, either from food or from blood itself arising from the naso-pharynx, the mouth, or from hæmorrhoids.

Whilst, however, all clinicians are agreed upon the necessity of eliminating the former possibility by insistence upon a hæmoglobin-free diet for at least three days preceding the test, it does not appear to be a point of universal agreement how far it is possible satisfactorily to exclude all sources of minute hæmorrhages or, from an equally practical standpoint, what degree of such hæmorrhage may be neglected. I am encouraged to raise this question by a statement in Dr. R. Coope's article in your issue of August 7th. He says: "Patients who use hard toothbrushes or who have a habit of sucking their gums often give the reaction for occult blood in the stools." It is, of course, beyond question that the greatest refinement as regards precautions is commendable; and, indeed, in a discussion upon the subject with a well-known chemical pathologist he gave the opinion that the slightest abrasion—even from the passage of an œsophageal tube—would supply sufficient blood to produce a definitely positive reaction in the stools, so sensitive was the benzidine reaction, the test which, like myself, he invariably employed.

My own investigations specifically related to this point certainly do not confirm the idea of an inconveniently exquisite sensitiveness. I lived for a month on a diet free from all hæmoglobin-containing constituents and green vegetables, during which time I ingested measured quantities of my own blood and tested every stool. This investigation was repeated during the war upon a large scale by the administration to patients upon a rigid milk diet of increasing quantities of their own blood. Lieutenant R. M. Mackay, R.A.M.C., working under my directions, embodied the results in a thesis for M.D. Edin., but I do not think the thesis was ever widely circulated, if published at all. The conclusion was that not until 1 c.cm. blood at one dose was taken could we be certain of a positive reaction. One cannot say, of course, if the more frequent ingestion of tiny quantities throughout the day would more easily lead to a positive result—the question of absorption is an important one—but certainly a cubic centimetre of blood is a fairly considerable quantity, and I am prompted to inquire if Dr. Coope or any other observer is really satisfied as the result of crucial tests that small gum abrasions alone have been responsible for a positive result.

I ought to add that whilst these tests were in operation the reagents were regularly tested and results controlled by the use of a solution of blood, whereby it was certain that even up to a dilution of 1 in 300,000 a marked positive reaction was obtained. The circumstance, then, of a negative reaction being possible when as much as ¾ c.cm. of blood has been introduced into the stomach hardly suggests that the benzidine test is "too sensitive"; nor, may I add, have I found it unreliable if all precautions with the reagents are taken; whilst its simplicity is a feature which must always make a strong appeal.

I am, Sir, yours faithfully,

ADOLPHE ABRAHAMS.

Park-crescent, Portland-place, W., August 14th, 1920.

FOOD POISONING FROM PARATYPHOID B INFECTION.

To the Editor of THE LANCET.

SIR,—Your annotation last week on the Carrier in Food Poisoning leads me to put on record the following case on account of the importance of bacteriological examination :—

I was called to see J. B., aged 59, on July 19th, suffering from severe diarrhœa and vomiting. Temp. 100° and pulse corresponding. Foul, coated tongue, but no abdominal pain beyond that caused by retching. Physical examination negative except for slight tenderness over stomach and descending colon. Normally a man with systolic pressure bordering on 200 mm. Hg, and therefore frugal in diet. Had retired to rest on previous evening feeling well, but was awakened at 4 A.M. with violent diarrhœa and sickness. He had had his usual diet with the exception of a small piece of cold sausage, which naturally fell under suspicion, but as the rest of the family had partaken of the same food without untoward results no food analysis was undertaken. The vomited matter appeared to be bile and the stools were liquid and almost milky in appearance. The following day he had 11 fluid evacuations during the 24 hours, still the same colour and very offensive. An injection of emetine hydrochlor., gr. ½, was given and digalen hypodermically. That evening he seemed better, temp. 98°, pulse stronger, no evacuation of the bowels for four hours. Next morning diarrhœa was constant and the patient in a condition of profound collapse, temp. 95°, pulse almost imperceptible at the wrist, knee-jerks and plantar reflex absent.

Dr. W. H. Willcox was called in consultation and a specimen of fæces was sent to Dr. E. J. Storer, Inoculation Department, St. Mary's Hospital, who reported as follows :—

Macroscopically: Milk-like fluid.
Microscopically: I found débris, few pus cells.
Culturally: Many non-lactose fermenting organisms giving the sugar reactions of the Solmonella group.
Morphologically: Gram-negative motile bacilli; serological reaction. Agglutination: Gaertner serum, 1/20; *B. para. A*, 1/20; *B. para. B*, 1/320; *B. aertrycke*, 1/32.
Sera absorbed with organisms: *B. para. B* serum, 1/25; *B. aertrycke*, 1/160; *B. botulinus* not isolated.
Conclusion: *B. para. B* infection.

A specimen of blood sent to Dr. Knyvett Gordon was returned "paratyphoid B positive in a dilution of 1 in 100."

Energetic stimulant measures were taken, salines were injected freely, oxygen inhalations through spirit, and pituitrin hypodermically. Patient remained gravely ill, with subnormal temperature, weak intermittent pulse, and four or five fluid evacuations a day until the 25th, when his temperature rose to 98° and he had only one semi-solid stool, less offensive and almost normal in colour. Since then his condition has steadily improved.

I had a similar case of paratyphoid B infection with much milder symptoms two months ago in a young adult. In this case there came under suspicion a veal pie, partaken for luncheon at his golf club, and yet on inquiry others who had lunched with him suffered no ill-effects. In the third week he developed a left-sided pleural effusion. These cases must be more common than one is led to believe, and in view of the evidence given by Dr. J. Priestley in the cases that occurred in London recently, the after-care of such patients is of the utmost importance.

I am, Sir, yours faithfully,
W. J. MCKEAND, M.B., Ch.B. Edin.

Compton-terrace, N., August 17th, 1920.

HERPES AND CHICKEN-POX.

To the Editor of THE LANCET.

SIR,—I have read Dr. Claude Ker's paper on Herpes and Chicken-pox in your issue of August 14th with interest. A number of instances of the supposed association of the two conditions have been recorded in *Guy's Hospital Gazette* in the last few years. One enthusiast even went so far as to record that, having diagnosed herpes in a parent, he prophesied successfully that the children would develop chicken-pox. I do not doubt his word; but it is difficult to weigh the evidence of all prophecy, because there are no records of the false ones. I have seen many cases of both diseases without finding any evidence to connect them, except for one patient with typical herpes zoster and a rash indistinguishable from chicken-pox, both present at the same time. The notes were recorded in the above-named gazette. However, there is enough evidence of a possible connexion to make the subject an interesting study; and more figures are needed, as Dr. Ker suggests, which will deal with *all* cases and not lay undue emphasis on the exceptional ones.

There are two points which he does not discuss which might be emphasised. First, from the clinical point of view, is the question of pain; it is a very constant symptom in herpes zoster, and of real practical importance in justifying the diagnosis of herpes if an unusual distribution of chicken-pox were under discussion. The second, much more important and apparently not generally known, is that the cerebro-spinal fluid in herpes zoster shows a marked excess of lymphocytes; several times I have found more than 100 per c.mm. (more than five may be taken as abnormal). The fluid must be examined early, as the lymphocytes soon subside.

I do not know whether any observations of the cerebro-spinal fluid have been made in chicken-pox, but it seems to me that this examination is likely to prove the most important single piece of evidence towards joining or separating the two diseases.

I am, Sir, yours faithfully,
HUGH BARBER.

Derby, August 17th, 1920.

Obituary.

SINCLAIR WHITE, C.B.E., M.D.R.U.I., F.R.C.S.ENG.,

LIEUTENANT-COLONEL, R.A.M.C.; LATE PROFESSOR OF SURGERY, UNIVERSITY OF SHEFFIELD.

BY the death of Sinclair White Sheffield loses one who has been a prominent figure in medical circles for many years, and latterly has taken a leading part in the affairs of the profession. His early death so soon after retiring from active practice, to enjoy the leisure for which he had worked so hard, is deeply regretted by a wide circle of colleagues and friends. Nearly 40 years ago he went to Sheffield, a stranger, unknown to anybody in the district; there he spent the whole of his active life. A year ago on his retirement his name as a great surgeon was a household word for many miles around, and the calls upon his services were more numerous than he could fulfil.

The story of his life is the old story of what a man can do by his own efforts provided he has brains, courage, and determination. Born in 1858 and graduating in 1879 after a brilliant career as a student at Queen's College, Galway, fate brought him for his first appointment to the Sheffield School of Medicine in the humble capacity of so-called "tutor." Coming as a complete stranger, the first impressions which he received of his new post and its duties could not have been very inviting. The School of Medicine was at that time about at its lowest ebb. Other schools had begun to develop on new lines, but for some years the medical school in Surrey-street remained as an example of the old medical schools of the period which Dickens described. Dark and dismal, it consisted of an anatomical theatre upstairs, leading out of a dissecting room with sawdust on the floor and an appearance of something between a stable and a dirty butcher's shop; whilst downstairs there was a musty old library and a so-called students' room in which the porter also prepared "bone specimens." In this room the students spent much of their time sitting round the fire, smoking. It was not exactly a healthy atmosphere. The "tutor" was the only paid teacher, and his duties included taking charge of the dissecting room, holding tutorial classes in anatomy and physiology, and generally superintending everything. For these varied functions a stipend of £100 per annum was paid. In the case of many men such surroundings would have either frightened them away or broken their spirit, but White was not of that kind. He set to work to make the best of it, and in helping the students helped himself to get the Primary Fellowship.

In course of time he became a resident at the Public Hospital and Dispensary (now the Royal Hospital), and, whilst there, took his Final Fellowship in 1884. His ability and energy soon brought him into favourable notice with the board and the staff, so that on completing his period of service he had no difficulty in getting recommended for the post of medical officer of health of Sheffield, which was then vacant. He entered upon the duties of his new post with vigour and zeal, and soon proved himself a public servant of exceptional value to the corporation. Of his work in that capacity deserve particular mention his important and fruitful researches upon "The Action of the Sheffield Water on Lead Piping and its Effects on the Health of the Community." The results of this work were of immediate practical value, and brought about a complete cessation of lead poisoning from water in the district. Apart from its technical side, there is no doubt that the tenure of this post afforded him many and varied experiences of business methods and general knowledge of all kinds which proved of value in his later career. It is obvious, however, that even at this stage of his life his aim was to become an operating surgeon, and that he was only holding the post of medical officer of health in order to keep going until opportunity offered itself.

After a few years he resigned this post to take up general practice in the west-end. His first surgical appointment was in connexion with the Sheffield Hospital for Sick Children, which was followed in the early "nineties" by his appointment to the Royal Hospital. Up to this time he continued his general practice, and it is probable that the amount of operative surgery which he obtained outside his hospital duties was not very great. It was not until a few years later that the real opportunity for which he had been waiting and preparing himself arose. A series of vacancies amongst the senior members of the Royal Infirmary staff having arisen rather rapidly, White was invited to join the staff as surgeon. From that time onwards his career as an operating surgeon progressed by rapid strides, and for many years, practically up to the time of his retirement, his surgical life was an extremely full one. Few men worked harder or spared themselves less. As a surgeon he was undoubtedly a master of his craft, with a sound and ripe judgment, courageous and resourceful, untiring and undismayed by difficulties. Outside his own wide sphere of operations, he was less well known than he deserved to be, and his name was less familiar than that of many whose ability was no greater. This is easily explained by the circumstances of his career. During the "writing" period of his life he had not the surgical opportunities; when the surgical experience offered itself he was too busy to write! Such few surgical writings as he published were all valuable contributions to practical knowledge, but he was not a writing man.

His connexion with teaching, which began as tutor at the medical school, was kept up almost without intermission, and culminated in the professorship of surgery, accepted in 1911, which he resigned only two years ago. As a lecturer he was not at his best. Speaking in public was always distasteful to him. He did not cultivate it, and anything in the nature of lecturing was an effort. In medical affairs, both local and general, he was deeply interested and took an active part, being secretary of the British Medical Association when it visited Sheffield in 1908, and later, on the death of the President (Professor Simeon Snell), occupying the presidential chair for the remainder of the year. He also held the posts of President of the Sheffield Medico-Chirurgical Society and of the Yorkshire Branch of the B.M.A. During the war his services in connexion with the 3rd Northern General Hospital were very strenuous. His work as medical officer in charge of the surgical department, and later as officer in charge of the hospital, undoubtedly hastened the breakdown which ended his life. Even before the armistice his health broke down, and a somewhat serious operation left him very much shaken. For his military services he was made a Commander of the British Empire.

Of his personality it is somewhat difficult to speak, for he was a reserved man really known only to very few. His manner was somewhat brusque and the kindness which lay behind it was not always allowed to be seen. Those, however, who had the privilege of really knowing him, whether as colleagues, patients, or personal friends, realised that there was a kind heart behind the outward manner, and that in all things he was generous, straightforward, and conscientious.

JAMES HERBERT RHODES, M.B. LOND., M.R.C.P.

Dr. J. H. Rhodes, who died in London on August 5th after a long and trying illness suffered with excellent fortitude, was born at Kendal in 1874. He took his medical course at St. Bartholomew's Hospital, qualifying in 1899, and becoming house physician to Sir Lauder Brunton, with whom he conducted a research on the presence of glycolytic ferment in muscle. Brunton then expressed his appreciation of the powers of keen insight along with patient and persevering work shown by his junior colleague. After four years as senior resident medical officer at the London Temperance Hospital Dr. Rhodes became officer in charge of the electrical department there and honorary physician to the Farringdon General Dispensary and Lying-in Charity. He was also consulting radiographer to the Royal Eye Hospital. Unfitted by his health for service abroad, Dr. Rhodes during the war was medical officer in charge of the Queen's Gate Red Cross Hospital and the electrical department at Lewisham Military Hospital.

In October, 1914, however, hearing that there was no X ray outfit in working order at Boulogne or its neighbourhood, he went out on behalf of the British Red Cross Society to see what he could do, taking with him two outfits and finding in seven hospitals either no apparatus or the apparatus unworkable. He was happy to see five hospitals fitted up with X ray apparatus in working order within a month and arrangements made in regard to two others. Since 1904 he had been in practice in South Kensington, latterly being occupied largely with the practice of artificial pneumothorax, in which he was specially interested.

One of his professional colleagues writes: Rhodes was undoubtedly one of the best types of general practitioner. An all-round knowledge of the scientific sides of medicine and surgery combined with an expert equipment in electrical work and in tuberculosis, these were only one side of his qualifications. On the other was a conscientiousness which refused to allow him to spare himself. With him the interest of the patient came before everything else, and this fact was so patent that it earned for him in no ordinary degree the affectionate regard of those who came under his care. Scrupulously sensitive in his relations with brother practitioners, he kept the spirit as well as the letter of a lofty ethical code. Thorough and painstaking, he was also modest and self-effacing to a degree, but with better health he would have attained great success as a London general practitioner.

JAMES KING KERR, M.D. Q.U.I., J.P.

Dr. Kerr, who died on August 10th at Belfast in his seventy-fifth year, was well known as a medical practitioner and esteemed as a citizen. He had long been suffering from diabetes, but continued to take an active part in public affairs. A native of county Antrim, he was born near Randalstown, studied at the Royal Academical Institution and at Queen's College, Belfast, graduating M.D. of the old Queen's University of Ireland in 1871. He then acquired a practice at Leytonstone, remaining there until his health broke down from overwork, when, after a voyage to China, he settled in practice at Knock, in the suburbs of Belfast. His public life began by unsuccessfully contesting a Parliamentary seat in county Antrim in 1900 as an independent Conservative. He entered the Belfast Corporation, where he rose to be an alderman and, in 1904, chairman of the Public Health Committee, and subsequently he became chairman of the Hospitals and Dispensaries Committee. He was a justice of the peace for Belfast and a governor of Campbell College. He is survived by a widow.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MINISTRY OF HEALTH (MISCELLANEOUS PROVISIONS) BILL.

SOME highly important questions of medical interest are dealt with in the Ministry of Health (Miscellaneous Provisions) Bill, which Dr. ADDISON, the Minister of Health, presented in the House of Commons on Monday, August 16th.

Incipient Mental Disorder.

Clause 10 relates to treatment for incipient mental disorder. It sets out that—

"(1) Notwithstanding the provisions of any Act, a person shall not, if the required conditions are complied with, be liable to any penalty for receiving to board, lodging, or taking charge of for a period not exceeding six months, or such longer period not exceeding in all 12 months, as may be approved by the Minister, and whether for payment or not, any person suffering from mental disorder which is incipient in character and of recent origin, but not being a person who has been certified as a lunatic under the Lunacy Acts, 1890 to 1911, or in respect of whom an order has been made under the Mental Deficiency Act, 1913. Provided that nothing in this section shall authorise any person who has been received into any institution, home, or house under this section to be detained therein if he delivers to the superintendent or other person, by whatever name called, having the charge of the institution, home, or house, or sends by post to the Minister, notice in writing that he desires to be discharged therefrom.

(2) The required conditions for the purposes of this section are as follows: (*a*) The institution, home, or house in which the person is received must be approved for the purposes of this section by the Minister. (*b*) No such person shall be received into the institution, home, or house except with his previous consent in writing and except on a certificate in writing by two duly qualified medical practitioners to the effect that that person is reasonably likely to benefit by treatment therein. (*c*) The superintendent or other person, by whatever name called, having charge of the institution, home, or house, shall on the demand of any person having authority to inspect the institution, home, or house produce all such written consents and certificates as aforesaid. (*d*) The reception under this section of any person into the institution, home, or house shall be reported to the Minister by the superintendent or other person aforesaid.

(3) Any institution, home, or house approved by the Minister under this section shall be periodically inspected by officers appointed for that purpose by the Minister.

(4) The Minister may make regulations for the purpose of carrying this section into effect."

The maximum penalty for a contravention of the section is a fine of £100 or imprisonment for six months, or both fine and imprisonment.

Hospitals on the Rates.

Clause 11 confers on county councils the power to provide hospitals and ambulances. The main part of the clause is in the following terms:—

"(1) The council of a county shall have power (*a*) to supply and maintain hospitals (including out-patient departments) for the treatment of illnesses and diseases generally, or for the treatment of any particular illness or disease, or any particular class of illnesses or diseases; and (*b*) to contribute, on such terms and conditions as may be approved by the Minister, to any voluntary hospitals or similar institutions within their area; and (*c*) to undertake the maintenance of any Poor-law hospitals or infirmaries within their area; and (*d*) to establish and maintain, or to contribute towards the cost of or otherwise aid in establishing or maintaining, an ambulance service for dealing with cases of accident or illness within their area.

(2) The councils of two or more counties may, with the consent of the Minister and subject to such conditions as he may prescribe, combine for the purposes of supplying and maintaining hospitals under this section, and where any councils so combine they may appoint a joint committee under Section 81 of the Local Government Act, 1888, and that section shall have effect accordingly.

(3) Section 132 of the Public Health Act, 1875 (which gives powers to recover the cost of the maintenance in hospital of a person who is not a pauper), shall apply to any patient who has received treatment in a hospital maintained by the council of a county under this section, and the council shall have the same power of recovering expenses as is given to a local authority under that section."

The expression "council of a county" includes the council of a county borough.

Clause 12 lays down that no person shall sell, supply, or deliver any clinical thermometer unless it has been tested, approved, and marked in accordance with regulations made by the Minister.

Certain amendments are proposed in enactments relating to the sale of food and drugs.

Clause 14 permits a port sanitary authority, with the approval of a Secretary of State and of the Minister, to authorise the medical officer of health of the authority to perform any duties in connexion with the medical inspection of aliens landing or desiring to land within the area.

HOUSE OF LORDS.

TUESDAY, AUGUST 10TH.

Dangerous Drugs Bill.

The Dangerous Drugs Bill was read a third time and passed.

WEDNESDAY, AUGUST 11TH.

Blind Persons Bill.

The Blind Persons Bill was read a third time and passed.

HOUSE OF COMMONS.

WEDNESDAY, AUGUST 11TH.

National Health Insurance Valuation.

Mr. CAUTLEY asked the Minister of Health if he would state when the valuation of the National Health Insurance Societies was likely to be completed.—Dr. ADDISON replied: The separate valuation of each of the 12,000 Approved Societies and branches which administer National Health Insurance is a task of immense magnitude. The work is being proceeded with under the supervision of the Government actuary, and very satisfactory progress is being made, but it will be some months before a general announcement of the results can be made.—Mr. CAUTLEY: Is it not possible to give some approximate date?—Dr. ADDISON: I am afraid it will not be before the end of the year at the earliest.

A Standard for Condensed Milk.

Mr. GRATTAN DOYLE asked the Minister of Health if he could now state what progress had been made by the committee set up to inquire into the determination of a standard for condensed milk; if he would take immediate steps to prevent the importation or manufacture of condensed milk with low standards of fat, to the great detriment of the consumer; if the committee had yet reported; and, if not, if he would state the reasons for the delay.—Dr. ADDISON replied: I understand that the committee hope to present their report to me very shortly. The matter will then have my careful attention.—Mr. HOWARD GRITTEN: May I ask when the right honourable gentleman proposes to proceed with the Milk and Dairies Bill, and whether there is not a good deal of opposition to it in the country?—Dr. ADDISON: I am aware that there is considerable interested opposition to one clause. We certainly hope to proceed with the Bill at the first possible opportunity.

Third London General Hospital, Wandsworth.

Mr. CLYNES asked the Minister of Health whether he could make any statement as to the present position regarding the Third London General Hospital, Wandsworth.—Dr. ADDISON replied: I have made every effort to secure the retention of this hospital for the use of the civilian population, but I have ascertained that the site of the hospital is held by the London County Council on trust for the purpose of an open space; that it was acquired by them before the war for that purpose from the Royal Patriotic Fund Corporation at less than market value in consideration of the use to which it was to be put; and that the Royal Patriotic Fund Corporation object to its use for a civilian hospital, and urge that the conditions on which the land was sold must be adhered to. Moreover, I understand that part of the price paid for the land was subscribed locally and that there is strong opposition to the land being diverted from use by the public as an open space. I am advised that legislation would be necessary in order to secure the retention of the hospital on its present site, and in the circumstances I do not think that Parliament would be willing to give the necessary powers. I have therefore regretfully come to the conclusion that I must abandon my efforts to obtain the use of the hospital on its present site for the civilian population.

Ventilation of Factories, Schools, and Coal-mines.

Major Sir KEITH FRASER asked the Minister of Health if he would take steps to improve the ventilation of the factories and schools in Leicestershire with a view of checking the increase of tuberculosis in that area; and would he consider a better system of ventilating the coal-mining levels than that which existed at present.—Dr. ADDISON replied: The number of notifications of tuberculosis in Leicestershire has diminished from 524 in 1914 to 364 in 1919. I am glad to state that this decrease is general throughout the country, the corresponding figures for England and Wales being 95,808 in 1914 and 74,647 in 1919. Questions as to the ventila-

tion of factories and coal-mining levels and of schools should be addressed to my right honourable friends the Home Secretary and the President of the Board of Education respectively.

Poor-law Reform Promised.

Mr. GILBERT asked the Minister of Health whether the Government proposed to bring in any legislation during the present Parliament dealing with the reform of the Poor-law and in any way altering the composition of the bodies which now administered the existing laws.—Dr. ADDISON replied in the affirmative.

Injurious Foreign Potable Spirits.

Colonel GRETTON asked the Minister of Health if he was aware that many complaints and allegations had been made of the bad quality and injurious results arising from the consumption of certain imported potable spirits; if the Ministry had taken any steps to test the truth or otherwise of such statements; if the Ministry had powers under the Food and Drugs Act to condemn imported potable spirits of bad quality; and, if so, had such powers ever been used.—Dr. ADDISON replied: Inquiries have been instituted into the allegations referred to, and I should be happy to consider any specific information in the honourable and gallant Member's possession. Under the Sale of Food and Drugs Acts the vendor of any article of food or drink which is either injurious to health or not of the nature, substance, and quality demanded is liable to prosecution. The Acts are administered by local authorities, and the Ministry of Health have no powers of condemnation.

A Hardship to Limbless Officers.

Colonel GREIG asked the Minister of Pensions whether, owing to the hardship caused by Army Council Instruction 326, of 1920, 2 (a), to limbless officers whose stumps were not sufficiently healed for an artificial leg or arm to be fitted in the time therein allowed, he would specially supplement their disability pensions until such limbs were fitted, so that it might amount to as much as their Service pay.—Major TRYON (Parliamentary Secretary to the Ministry of Pensions) replied: When an officer, who has been demobilised, is waiting to be fitted with an artificial limb and is unable to provide for his own support he may be granted, from the Ministry, disability retired pay at the maximum rate during the waiting period, and I have no authority to make any larger allowances.

Inferior Drugs and Dressings in India.

Mr. SPOOR asked the Secretary of State for India whether his attention had been drawn to the circular letter issued on Sept. 15th, 1919, by the Government of India (Indian Munitions Board) to the various local governments and administrations in India concerning the drugs and surgical dressings required by the forces in the field supplied to Government by a firm of chemists in Bombay, and stating that the drugs were so adulterated and the dressings so medicated and otherwise below the represented quality as to imperil the lives of soldiers; that this was done deliberately by the firm in question to swell its own profits; that the name of the firm had therefore been removed from the Government of India list of contractors, and recommending that it should be removed from the lists of contractors to the provincial governments; whether, in communicating this information to the public through the press, the name of the firm in question was suppressed and was still being withheld, and why; whether he would communicate the name of this firm to the House and explain the reasons of the Government of India for their failure to prosecute the directors or managing directors, or both; and whether he would direct that such prosecution should take place.—Mr. MONTAGU replied: I have no information on the matter to which the honourable Member refers, but I will inquire.

MONDAY, AUGUST 16TH.

Travelling Facilities to Men under Treatment.

Colonel ASHLEY asked the Minister of Pensions whether any facilities could be given to wives to visit their husbands while undergoing treatment away from home when the treatment was prolonged and the man's condition prevented him travelling; and whether, in view of the hardship otherwise involved, he would consider the question of granting such facilities.—Major TRYON replied: Under the present regulations of the Ministry a man undergoing treatment in an institution away from home may be provided with a half-fare railway ticket to enable him to visit his home after each three months' treatment, or alternatively with a full-fare ticket after each six months' treatment. I am satisfied that there is hardship where a married man is not sufficiently convalescent to visit his home, and is therefore debarred from benefiting by the concession. I am glad to be able to say that arrangements have now been sanctioned under which the free travelling privileges now granted to the man during treatment in an institution can, in future, be transferred to his wife when the husband's condition does not admit of his travelling home.

The London University Site.

Mr. GILBERT asked the Chancellor of the Exchequer whether, having regard to the fact that the Government did not propose to proceed with the purchase of the Bloomsbury site for the University of London unless and until the University accepted the offer, and having regard to the report of the valuer of the London County Council as to the relative value of certain sites and the present inability of the Government to offer any contribution towards the erection of the required buildings on the Bloomsbury site, he would hold over the purchase money for the site to be devoted to such purposes, subject to the approval of the Government, as the Senate of the University might recommend as most serviceable for the recognised object of the University, and for the furtherance of university education in London as the metropolis of the British Empire.—Mr. BALDWIN (Financial Secretary to the Treasury) replied: No, Sir. For the reasons which I gave on Tuesday last the offer of the Government relates only to the Bloomsbury site.

Facilities for Transfer to Ordinary Hospitals.

Mr. BRIANT asked the Secretary for the Home Department whether he would consider the desirability of further facilities for the transfer of sick prisoners to ordinary hospitals.—Mr. SHORTT replied: The powers which already exist and are very freely used for the transfer of sick prisoners to ordinary hospitals are found to be sufficient for the purpose.

Third London General Hospital, Wandsworth.

Colonel Sir GODFREY COLLINS asked the Secretary for War if he could state the approximate cost of the Third London General Hospital, Wandsworth; and would he say if this hospital was to be broken up or transferred to either the Ministry of Health or a local authority.—Sir A. WILLIAMSON (Financial Secretary to the War Office) replied: The Third London General Hospital consisted of the Royal Victoria Patriotic School buildings and grounds and a hutted portion on the common adjoining the school. Approximately £69,000 was spent on the hutted portion. During 1919 the school buildings and grounds were surrendered and the hospital concentrated in the hutted portion on the common. The hospital was closed on July 31st last, and is being reported to the Disposal Board as surplus to military requirements. With regard to the latter part of the question I would refer the honourable and gallant Member to the reply given by my right honourable friend the Minister of Health to a similar question asked by the right honourable Member for Platting on Wednesday last.

Protection of Mentally Defective Persons Bill.

Mr. WIGNALL presented a Bill to make further provision for the protection of lunatics, idiots, and imbeciles, and other mentally defective persons from sexual immorality and from conduct akin thereto or connected therewith; and for purposes relating to the matters aforesaid. The Bill was read a first time.

Medical News.

KING'S COLLEGE (UNIVERSITY OF LONDON): PUBLIC HEALTH DEPARTMENT.—At King's College the department of Public Health, recently reorganised under the general supervision of Professor W. J. R. Simpson, now offers complete courses of instruction for the various special degrees and diplomas. Lectures are delivered on hygiene, sanitary law and administration, sanitation, and vital statistics by Dr. D. Sommerville, and on the Food and Drugs Acts by Mr. Rhys Charles. Bacteriology and parasitology are taught by Professor R. T. Hewlett and Dr. F. E. Taylor, and the chemical laboratory work is in charge of Mr. William Partridge. The laboratories are open daily for instruction and research, and arrangements have been made to suit the convenience of those engaged in practice. Weekly demonstrations on sanitary appliances and visits to places of sanitary interest are arranged. A special course on industrial hygiene will be given by Dr. T. M. Legge (October to February), and on school hygiene by Dr. A. J. Malcolm (October to June).

AMALGAMATION OF THE BRISTOL HOSPITALS.—The Bristol General Hospital committee has signified its willingness to enter, on certain conditions, into an amalgamation with other voluntary medical institutions of the city for a period of three years. As has already been stated in THE LANCET, this committee could not see its way to an irrevocable surrender of its trust to a newly constituted comprehensive council, but it considers a trial of three years feasible on condition that its present assets are not pooled with those of the other hospitals, and that the hospital remains a general hospital.

WHITE CLIFF HOSPITAL, TORQUAY.—The Western Hospital, Torquay, was established in 1850 for the treatment of incipient consumption and was supported by voluntary contributions. During the war it was used for the treatment of tuberculous soldiers, and has recently been purchased by the Devon County Council. It will be known in the future as the "White Cliff," and will be used for the treatment of tuberculous patients.

THE LATE Dr. R. G. FENDICK.—Robert George Fendick, late senior surgeon to the Bristol Dispensary, died recently at Eastbourne in his seventy-fifth year. A son of the late Mr. J. Fendick, M.R.C.S., of Bristol, Dr. Fendick was educated at Bristol Medical School, qualified M.R.C.S. in 1867, and practised for many years in Bristol and Clifton, where he was highly esteemed.

DORSET MENTAL HOSPITAL.—Dr. G. E. Peachell, the medical superintendent of this hospital, in his annual report for 1919 states that the institution now accommodates 541 patients from the county of Dorset, 95 from out-county unions, 22 service patients, and 233 private patients. No other county mental hospital has so large a number of private cases, which were very beneficial for the county rates. In alluding to the chief causes of insanity amongst the patients, Dr. Peachell mentions that he has been struck with the few cases in which alcohol appeared to be a factor.

ROYAL CORNWALL INFIRMARY, TRURO. — The medical report presented at the annual meeting of this institution showed that 711 in-patients and 1459 out-patients had been treated. The expenditure was £5947 and the total deficit against the infirmary up to last May was £419. The chairman, Canon Graves, urged the advisability of making a charge to those patients who were able to pay, and the matter was recommended to the governors for consideration. A tender for £13,819 for the renovation and enlargement scheme had been accepted and the work was now proceeding. £9800 had been received in response to the appeal for this purpose, but it is estimated that a sum of £15,000 will be required to meet the total cost.

ROYAL DEVON AND EXETER HOSPITAL.—At a recent meeting of the governors of this hospital it was reported that the cost of the new Victory wing which is to be added to this institution will be about £40,000, towards which £24,000 have been raised. The governors considered that for the better accommodation of the nursing staff it would be advisable to build a second storey on to the Victory wing, at an estimated cost of about £12,000, and this was agreed to by the meeting. It was stated that the patients will have to make contributions towards their cost of maintenance, and a special meeting will be held to consider this question. The president, General Stirling, said that the question of the amalgamation of the hospital with the Exeter Dispensary had been carefully considered, but it was decided that such a scheme was not feasible.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on August 10th, 22 cases were considered, and £244 11*s*. 1*d*. voted to 20 of the applicants. The following is a summary of some of the cases relieved:—

* L.S.A. Lond., aged 63, married, who for some years has acted as locum tenens. Has recently completely broken down in health, and is suffering from tabes dorsalis and is in Guy's Hospital. Last year only earned £121. Rent £32 10*s*., and wife lets an unfurnished room at £11 4*s*. Friends have given £10. No prospect of applicant being able to work again, and they are practically destitute. Voted £26 in 12 instalments. —Daughter, aged 62, of M.R.C.S. Eng. who practised at Bradford, Yorks, and died in 1903. Owing to nervous breakdown applicant has been for some time in a nursing home. Is now staying with friends, who will be unable to keep her. Income £50 from investments. Desirous of getting into a home. Voted £12 in 12 instalments. —Wife, aged 46, of F.R.C.S. Irel. who practised in London. Owing to overwork during the war and financial worry applicant's husband is now completely incapacitated, and it is not expected that he will be able to work again. Three children, aged 23, 20, 10. The eldest, a daughter, earns £3 a week. The son, aged 20, is going to Australia. Rent £115, for 11-roomed house, the lease of which runs out in September, when £300 will be required for dilapidations. A friend has lent the money to pay the rent up to September. Desirous of getting a house and letting rooms, and asks for help to make a start and towards the youngest son's education. Voted £10. —Daughter, aged 56, of M.R.C.S. Eng. who practised at Box and died in 1894. Suffers from ill-health, and is unable to earn anything. Shares everything with her two sisters, one of whom has help from the Fund. Relieved ten times, £132. Voted £12 in 12 instalments. —Daughter, aged 61, of M.R.C.S. Eng. who practised at Leatherhead and died in 1861. Until recently has acted as school matron at £30 a year, but is at present out of employment, and, owing to her age, finds it difficult to obtain another post. Is at present staying with friends. Has no income but that which she earns. Relieved once, £10. Voted £5.

Subscriptions may be sent to the honorary treasurer, Sir Charters J. Symonds, at 11, Chandos-street, Cavendish-square, London, W.1.

ROYAL SANITARY INSTITUTE.—The next Congress of the Royal Sanitary Institute will be held at Folkestone in June, 1921.

THE Wellcome Historical Medical Museum, at 54A, Wigmore-street, London, W., will be closed for cleaning and decoration from Sept. 1st to 30th.

THE LATE DR. C. W. VICKERS.—Charles William Vickers died at Paignton, Devon, on August 1st, in his seventy-third year. Dr. Vickers received his medical education at King's College Hospital and the London Hospital, and after qualifying M.R.C.S. in 1870, practised for a time in London, and came to Paignton for the benefit of his health in 1883. He took his D.P.H. in 1896 and was for 29 years medical officer of health for Paignton. Dr. Vickers was a painstaking medical officer of health, and his work was much appreciated by the residents of Paignton until his recent retirement. About 20 years ago small-pox occurred amongst the men working on the construction of the waterworks, and his energetic methods prevented any spread of the disease. Dr. Vickers leaves a widow and one son.

TECHNICAL PHARMACY.—Courses are now instituted in technical schools to prepare students for the examinations of the Pharmaceutical Society, and the Pharmaceutical Society of Great Britain has decided to divide its qualifying examination into two parts. The subjects of Part I. are Chemistry, Botany, and Physics, and the subjects of Part II., Pharmacy, Materia Medica, and other technical subjects. The society will henceforth require that students who offer themselves for the qualifying examination shall have pursued an approved course of study in an institution approved by the society. A circular from the Board of Education to local educational authorities as well as technical schools points out that the Board is informed that the society recognises and approves, for the purposes of Part I. of its examination, all those institutions which are already recognised by the General Medical Council. Special considerations, however, arise in connexion with Part II. of the examination. The efficient teaching of the subjects of this part of the examination entails considerable expenditure on equipment and stores, and for certain subjects the appointment of a specially qualified teacher. The Board understands that the society has approved courses preparing for Part II. of its examination in nine technical schools and colleges in various parts of the country, and that in these institutions alone provision can be made for 700 students, a number which is largely in excess of the number who annually qualified in pharmacy before the war. In these circumstances the Board does not propose to recognise, under its regulations, any course in the subjects of Part II. of the Pharmaceutical Society's Qualifying Examination, unless the Pharmaceutical Society has previously approved the course for its own purposes.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, TINDALL, AND COX, London.
The Course of Operative Surgery. A Handbook for Practitioners and Students. By Professor Dr. V. Schmieden and A. Turnbull, M.B. Glasg. With Foreword by Professor Dr. A. Bier. 2nd ed. Pp. 350. 25*s*.
An Introduction to the Study of Hypnotism, Experimental and Therapeutic. By H. E. Wingfield, M.D. 2nd ed, Pp. 195. 7*s*. 6*d*.

BALE, J., SONS, AND DANIELSSON, London.
The Serbian Epidemics of Typhus and Relapsing Fever, 1915. Their Origin, Course, and Preventive Measures employed for their Arrest. By William Hunter, C.B., Col. A.M.S. Pp. 158. 7*s*. 6*d*.
Gonococcal Infection in the Male. For Students and Practitioners. By N. Lumb, O.B.E., M.B., B.S. Pp. 328. 25*s*.
Military Sanitation. A Handbook for Soldiers. By Col. R. J. Blackham, C.B., C.M.G., C.I.E., D.S.O. 3rd ed. Pp. 140. 10*s*. 6*d*.

CASSELL AND CO., London.
A Handbook of Midwifery. By Comyns Berkeley, M.C., M.D. Cantab. 4th ed., enlarged. Pp. 550. 7*s*. 6*d*.

CHAPMAN AND HALL, London. WILEY, J., New York.
Manual of Psychiatry. Edited by A. J. Rosanoff, M.D. 5th ed. Pp. 684. 22*s*.

CHURCHILL, J. & A., London.
A Manual of Dental Metallurgy. By E. A. Smith, Associate of the Royal School of Mines. 4th ed. Pp. 286. 12*s*. 6*d*.

CONSTABLE AND CO., London.
Free Will and Destiny. By St. George Lane Fox Pitt. With an Open Letter on the International Moral Education Congress and the League of Nations, by Rt. Hon. Sir Frederick Pollock, Bart., P.C., and an Appendix by Frederick J. Gould, Hon. Secretary, International Moral Education Congress. Pp. 100. 5*s*.

FROWDE, H., AND HODDER AND STOUGHTON, London.
Clinical Ophthalmology for the General Practitioner. By A. Maitland Ramsay, M.D. With Foreword by Sir James Mackenzie, M.D. Pp. 500. 42*s*.

GRIFFIN, CHARLES, AND CO., London.
Medico-Tropical Practice. By G. E. Brooke, L.R.C.P. Edin., D.P.H. 2nd ed. Pp. 522. 18*s*.

HOEBER, PAUL B., New York.
Epidemic Encephalitis (Encephalitis Lethargica). By Prof. F. Tilney, M.D., and H. S. Howe, M.D. Pp. 270. $3.50.

MACMILLAN AND CO., London.
The Bradshaw Lecture on the Surgery of the Heart (Dec. 11th, 1919). By Sir C. A. Ballance, K.C.M.G., C.B., M.V.O. Pp. 154. 10*s.* 6*d.*

MASSON ET CIE, Paris.
Chirurgie Réparatrice et Orthopédique Appareillages et Invalidités. Ouvrage publié sous la direction de MM. Jeanbrau, Nové-Josserand et Ombrédanne, professeurs agrégés aux Facultés de Montpellier, de Lyon et de Paris, Secrétaire de la Rédaction. P. Desfosses, chirurgien de l'hôpital britannique à Paris. 2 vols. Pp. 1340. 80 francs.

PUTNAM'S, G. P., SONS, LTD., London.
Radiant Motherhood: A Book for those who are Creating the Future. By Marie Stopes, D.Sc., Ph.D. Pp. 246. 6*s.*

SOCIETY FOR PROMOTING CHRISTIAN KNOWLEDGE, London.
Florence Nightingale. By Eleanor F. Hall. Pp. 84. 3*s.* 6*d.*
Elsie Inglis. By Eva S. McLaren. With Preface by Lena Ashwell. Pp. 80. 3*s.* 6*d.*

THE ANGLO-EASTERN PUBLISHING CO., LTD., London.
Wedded Love or Married Misery? A Book of Health and Necessary Knowledge for the Married and those about to Marry. By W. N. Willis. Pp. 182. 6*s.* 6*d.*

THE MACMILLAN CO., New York.
The Treatment of Syphilis. By H. S. Baketel, A.M., M.D. Pp. 167.

THE ROCKEFELLER INSTITUTE, New York.
Studies from the Rockefeller Institute for Medical Research. Reprints Vol. XXXII. Pp. 610.

THIEME, G., Leipzig.
Diagnostischer Leitfaden für Sekret und Blutuntersuchungen. By Dr. C. S. Engel. Pp. 303. 12*s.*

UNIVERSITY PRESS, Liverpool.
Liverpool School of Tropical Medicine. Historical Record 1898–1920.

UNIVERSITY OF LONDON PRESS.
Animal Experiments and Surgery (Hunterian Lectures, 1920). By W. G. Spencer, M.S., F.R.C.S. Pp. 180. 6*s.*

WRIGHT, J., AND SONS, Bristol.
A Synopsis of Medicine. By H. L. Tidy, M.D. Pp. 952. 26*s.*

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BURROUGHS, A. E., M.D. Edin., has been appointed Specialist Medical Referee for Ophthalmic Cases under the Workmen's Compensation Act, 1906, for County Court Circuit No. 6.

St. Thomas's Hospital: HUMPREYS, R. M., M.B., B.Ch. Oxon., WHITCOMBE, R. C. P., M.R.C.S., L.R.C.P. Lond., KENDALL, G. M., M.B. Cantab., GARNETT, D. G., M.R.C.S., L.R.C.P. Lond., WONG, M., M.R.C.S., L.R.C.P. Lond., D.T.M., MAXWELL, L. B., M.R.C.S., L.R.C.P. Lond., LOW, W. A., M.R.C.S., L.R.C.P. Lond., Casualty Officers and Resident Anæsthetists; HOBBS, F. B., M.R.C.S., L.R.C.P. Lond., BLAMPIED, H. J., M.R.C.S., L.R.C.P. Lond., ORME, E. S., M.R.C.S., L.R.C.P. Lond., BRETT, P. C., M.R.C.S., L.R.C.P. Lond., Resident House Physicians; WARE, S. A. T., M.R.C.S., L.R.C.P. Lond., Resident House Physician for Children; CHURCHER, D. G., M.B., B.S. Lond., SMART, A. H. J., M.B., B.Ch. Cantab., NEILSON, D. F. A., M.R.C.S., L.R.C.P. Lond., BROCKMAN, E. P., M.B., B.Ch. Cantab., Resident House Surgeons; MARRINER, H. I., M.R.C.S., L.R.C.P. Lond., Resident House Surgeon for Ear, Nose, and Throat; ROBINSON, R. H. O. B., M.B., B.Ch. Cantab., House Surgeon; COOKE, R. C., M.R.C.S., L.R.C.P. Lond., Senior Obstetric House Physician; HALE, J., B.Ch. Cantab., Junior Obstetric House Physician; CARDELL, J. D. M., M.R.C.S., L.R.C.P. Lond., Senior Ophthalmic House Surgeon; ROBERTS, E. D. T., M.R.C.S., L.R.C.P. Lond., Junior Ophthalmic House Surgeon; CAVENAGH, J. B., M.B., B.Ch. Oxon., BYRNE, C. H. C., M.B., B.S. Lond., HOLMES, H. W. H., M.R.C.S., L.R.C.P. Lond., Clinical Assistants (Throat); BACK, G. A., M.R.C.S., L.R.C.P. Lond., Clinical Assistant (Skin); HOLMES, H. W. H., M.R.C.S., L.R.C.P. Lond., Clinical Assistant (Ear).

Certifying Surgeons under the Factory and Workshop Acts: JARDINE, W. C., M.B., Ch.B. Edin. (Wombwell); HEMMING, C. P., M.R.C.S. (Bishop's Waltham); KINNEAR, F., M.B., Ch.B. Aberd. (Shefford); DARBY, W. S., M.B., B.C. Camb. (Harrow); COURT, C. C. C., M.B., Ch.B. Birm. (Okehampton).

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £250.
Battersea General Hospital (Incorporated), Battersea Park, S.W.—Third Res. M.O. £200.
Belfast County Borough.—Bacteriologist and Pathologist. £700.
Bengal, University of Dacca.—Chair of Physical Education. Rs. 9000 to Rs. 12,000.
Bethnal Green Infirmary, Cambridge-road, Bethnal Green, E.—Asst. Med. Supt. £400.
Birmingham Children's Hospital.—Jun. Vis. Anæsth. £50. Res. M.O. £150.
Birmingham General Hospital.—Res. H.S. £100. Res. M.O. £155. Res. Anæsth. £100.
Birmingham, Queen's Hospital.—Third P. to Out-patients. £50. Cas. S. £100. Dent. S. £50. Surg. Registrar. £100.
Birmingham University.—Demonstrator in Pathology. £350.
Blackburn and East Lancashire Royal Infirmary.—Jun. H.S. £250
Brighton, Royal Sussex County Hospital.—Asst. H.S. £150.
Bristol Eye Hospital.—H.S. £150.
Bristol General Hospital.—Two H.P.'s, H.S., and Obstet. O. and H.S. £175 each.
Cancer Hospital, Fulham-road.—Asst. P. and Med. Reg. £250.
Canterbury, Chartham Mental Hospital.—Asst. M.O. £350.
Cardiff, Talgarth, Breconshire, South Wales Sanatorium.—Second Asst. Res. M.O. £400.
Chester County Asylum.—Second Asst. M.O. £425.
Church Army Lads' Sanatorium, near Farnham, Surrey.—Medical Superintendent.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Deptford Metropolitan Borough.—Second Asst. M.O.H. and Welfare Officer. £600.
Devonport, Royal Albert Hospital.—H.S. £200.
Dorset County Council.—Asst. County M.O.'s. £500.
Edinburgh Royal Infirmary.—Asst. Path., Asst. Clin. Path. £500 each. Also Second Asst. Clin. Path. £350.
Egyptian Government, Ministry of Education.—Prof. of Pharmacology. L.E. 1,200–1,440. Lecturer in Anat. L.E. 720.
Essex Education Committee.—Sch. Med. Inspec. £500.
Gloucestershire Royal Infirmary and Eye Institution.—H.P. £175.
Great Yarmouth General Hospital.—H.S. £250.
Hove, Carr-Burton Memorial Hospital, Sackville-road.—Res. M.O. £250.
Huddersfield Royal Infirmary.—Asst. H.S. £150.
Hull Royal Infirmary.—H.S. £200. Asst. H.S. £150.
Ingham Infirmary and South Shields and Westoe Dispensary.—Jun. H.S. £175.
Lancashire County Council, Rufford Sanatorium and Training Centre.—Med. Supt. £800.
Leeds University, School of Medicine.—Lect. in Exper. Phys. £500.
Leicester City Isolation Hospital and Sanatorium, Groby-road.—Two Res. M.O.'s. £500 and £350 respectively.
Leicestershire and Rutland Mental Hospital, Narborough, near Leicester.—Jun. Asst. M.O. £350.
Liverpool, Royal Liverpool Children's Hospital.—Two Res. H.P.'s and Two Res. H.S.'s. £90 each.
Liverpool, Royal Southern Hospital.—Two H.P.'s and Three H.S.'s. £100.
Liverpool School of Tropical Medicine.—Three Medical Men for Clinical and Research Work in Tropical Medicine.
London County Council Mental Hospital Service.—Asst. M.O.'s.
London Lock Hospital, Soho, W.—H.S. £200.
London Temperance Hospital, Hampstead-road, N.W.—Hon. Radiographer. Cas. O. £200. H.P. £120.
M.A.B. Tuberculosis Service.—Asst. M.O.'s at Margate, £515; at Brentwood, £579.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Manchester, Ancoats Hospital.—H.S. £150.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester, St. Mary's Hospitals for Women and Children.—H.S. for Whitworth Park Hospital. £100.
Margate, Royal Sea Bathing Hospital.—Res. S. £200.
Metropolitan Borough of Wandsworth.—Asst. Tuberc. O. £818.
Middleton-in-Wharfedale Sanatorium, near Ilkley.—Asst. M.O. £500.
Newcastle-upon-Tyne Hospital for Sick Children.—Hon. Asst. P.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Lecturer on Medical Jurisprudence. Sen. and Jun. Demonstrators of Anatomy. £450 and £350 respectively.
Nottingham General Hospital.—H.S. and H.P. £200 each.
Orkney, Parish of Rousay and Egilshay.—Res. M.O. £300.
Reading, Royal Berkshire Hospital.—Second H.S. £200.
Scarborough Education Committee.—Sch. Dent. S. £250.
Sheffield Royal Infirmary.—H.P. £150.
Southport County Borough.—Asst. M.O.H. and Asst. Sch. M.O. £500.
Southport General Infirmary.—Sen. H.S. £250.
Stafford, Staffordshire General Infirmary.—H.S. £250.
University of London.—Prof. of Med. and Director of Med. Clin. £2000.
Whalley, near Blackburn, "Calderstones," Certified Institution for the Reception of Mental Defectives.—Sen. Asst. M.O. £665.
The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Gatehouse.

Births, Marriages, and Deaths.

BIRTHS.

CARR.—On July 18th, at Makwar, Blue Nile, Sudan, the wife of B. G. D'Rastricke Carr, M.C., Medical Inspector, of a daughter.
DICKSON.—On August 14th, at Grindley House, Newcastle, Staffordshire, the wife of Robert H. Dickson, F.R.C.S.—a daughter.
OSBORN.—On August 14th, at Sheet-street, Windsor, the wife of Dr. A. G. Osborn, of a daughter.
PRENTISS.—On August 9th, the wife of Dr. H. H. Prentiss, of Cowbeech, Sandhurst, Kent, of a daughter.
WOOLLEY.—On August 13th, at Brunswick-place, Hove, the wife of Lieut.-Col. J. M. Woolley, I.M.S., of a son.

DEATHS.

CHRISTIE.—On July 22nd, on s.s. *Moghilev*, William Ledingham Christie, M.D., F.R.C.S.
HENSLEY.—On August 8th, at The Ark, Farnham, Philip John Hensley, M.A., F.R.C.P., M.D., in his 82nd year.
JONES.—On August 13th, at Lewisham-road, James Jones, M.D., aged 77 years.
MEARS.—On August 10th, at 13, Windsor-gardens, North Shields, Frederick Charles Mears, M.B., M.R.C.S., L.S.A.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

A NATIVE MEDICAL SCHOOL IN UGANDA.

By E. N. Cook, M.B., B.Sc. Lond.

A NOVEL and interesting experiment in training natives in medical and surgical work is being made in Uganda. The romance of the undertaking lies in this. Native boys who are the raw material from the best schools of the country are being taken, and are receiving a three years' course of training at the large C.M.S. Hospital at Mengo, the native capital of Uganda, where the medical school began its work three years ago. Twelve lads, of the highest standard of education as yet attained in Uganda, were selected by the Native Government and sent to the hospital to be trained. They are extraordinarily keen and readily absorb any knowledge imparted to them. They live in a hostel attached to the hospital and attend lectures on anatomy, physiology, medicine, surgery, elementary chemistry, pharmacy, and English. In the operating theatre they give anæsthetics and assist in the sponging, &c., at operations; in the wards they act as clerks and dressers to the doctors; in the pathological laboratory they examine blood-films and various kinds of specimens. In the dispensary, with its crowd of native and Indian patients, they themselves examine the cases under the direction of the doctors.

It is curious to watch the black man writing a prescription or making up accurately the mixture that has been ordered. The teachers responsible for the training are the doctors and sisters in the hospital, who, over-worked as they are, make time for this voluntary work for the good of the country. Thus the need has arisen for a young and enthusiastic doctor to devote his time to the work. I have taken a part in the working of this school, and can speak from experience of the fascination of breaking new ground—taking intelligent natives and building a medical education upon their school training.

The study of tropical diseases in Central Africa, with all its opportunities of investigating methods of treatment in connexion with a well-organised hospital, is of never-failing interest. Blackwater fever, malaria, tick fever, sleeping sickness, and the like can be studied there better perhaps than in any other country. Research work is needed in many un-pigeonholed diseases, and a well-established medical training centre at the capital will, it is believed, be of value to the whole country in sending out natives trained up to the standard of clinical assistants who will be able to run native dispensaries throughout the country.

The British Government have this year guaranteed the stipend of a doctor to go out under the C.M.S. as superintendent of the medical training in Uganda. It is a unique opportunity for a man keen on teaching, and offers unlimited opportunities of investigating new or partly-known tropical diseases. There is at the present time an urgent need felt for supplying native dispensaries with natives trained in the country, and along with this an anti-venereal campaign is being planned by the Government. Treatment of venereal diseases is taken as a special part of the curriculum, and the students have great facilities in the practical treatment of venereal diseases in the special wards devoted to them. The present lot of students completed their three-years' course last January, and entered for a final examination for a Government certificate. Four students obtained the certificate, and this marks but the first stage in the progress of medical training in Uganda. There is a vast difference between the native medicine-man with his beads and incantations and these lithe and athletic young Baganda Christians, trained under up-to-date medical methods.

The difficulty of this work in Uganda, as compared with India or China, where the medical training of natives has been going on for years, is that there they have an already educated manhood upon which to graft the medical knowledge, whereas in Uganda general education is as yet in its earliest stages. It is, moreover, a country with no literature as yet, and eventually it is hoped the training will be given in English, but meantime medical handbooks in the vernacular are urgently required. At the present moment the school is closed owing to depletion of staff and the fact that I am on leave in England.

Geographically, the strategic importance of Uganda is fully recognised, and now that German East Africa has been re-labelled Tanganika Territory there is an "all-red" strip of British territory from Cairo to the Cape. Uganda lies half-way along this journey and is also the terminus of the railway through East Africa from Mombasa. Uganda is rapidly becoming the hub of the African universe, and from it will radiate knowledge, progress, and relief of suffering to the surrounding millions who are placed under British protection.

A laboratory class of native students in Uganda.

A HANDY INCOME-TAX GUIDE.

A STIFF paper folder of 10 pages entitled "Income-tax and Super-tax: a Tabular View, 1842–1921," explains the 1920 Budget changes, and shows in a concise and handy form the present position of income-tax and super-tax, along with the several rates, exemptions, deductions, allowances, and so forth, now in force. The publication can be obtained from Messrs. Oliver and Boyd, 33, Paternoster-row, London, E.C., at 1*s*. (post-free, 1*s*. 2*d*.), and is well worth the money to any income-tax payer.

THE LONDON ASSURANCE, 1720–1920.

AN assurance company is naturally proud of a history of 200 years, and the souvenir of the bicentenary of the London Assurance which lies before us, written in Mr. G. S. Street's graceful manner and printed for private circulation, gives an interesting picture of bygone days and also a remarkable record of how a well-managed business concern can fight disaster successfully, and from small beginnings grow into a vast and eminently prosperous undertaking. The London Assurance grew out of a scheme of Marine Insurance started in 1719 by Lord Chetwynd, unkindly known as "Chetwynd's Bubble," and another insurance scheme known as "Overall's." A Royal Charter for Marine Insurance was granted in 1720, and one for Fire and Life in 1721. Chetwynd was the first governor, and Overall was an official of the company. In 1731 he was secretary, and in 1755, about which date he died, it appears that there was a deficiency in the funds of £213 3*s*. 11*d*. The company had a hard time in its early youth, for some eight months after the granting of the Charter the South Sea Bubble burst. In the first year of its existence the value of the shares (£25) fluctuated between £160 and practically nothing, but nevertheless they weathered the storm.

Mr. Street has collected from the minute books of the company and from sundry newspaper cuttings preserved by

the secretary a collection of interesting facts and occurrences in the history of the institution. In March, 1806, we find the firemen and porters being supplied with clothing. The jacket of the former cost £4 10s., that of the latter £4 8s., "including waistcoats with sleeves and plush breeches." Such clothing inspired the W.S. of Rejected Addresses.

"Starting from short and broken snooze
Each sought his ponderous hob-nailed shoes,
But first his worsted hosen plied,
Plush breeches next in crimson died
His nether bulk embraced.
Then jacket thick of red or blue
Whose massy shoulder gave to view
The badge of each respective crew
In tin or copper traced."

A picture of such badges is given opposite p. 36 of Mr. Street's book.

We have only space for two more incidents. On Feb. 29th, 1768, the office in Birchin-lane was held up, quite in to-day's fashion, by a madman, who hit the one clerk over the head with a pistol and decamped with nearly 250 guineas. In 1786 a lady, by name Elizabeth Wade, was tried for setting fire to her lodgings near Coldbath Fields. Much combustible material was found lying about, and the whole of her property was valued at £20. She had shortly before insured with the company for £1500. The chairman of the quarter sessions, however, proceeded, after dwelling on the enormity of her offence, to sentence her to a fine of 1s. and 12 months' imprisonment. Considering the draconic nature of the criminal code at that date—stealing from a shop to the value of 5s. was a capital offence—Elizabeth was extraordinarily lucky.

EGYPTIAN WATER-SUPPLIES.

SINCE the early part of 1915 the Department of Public Health in Egypt has made special efforts to undertake the regular inspection of all public water-supplies, whether in the hands of the Government, of municipalities, companies, or private individuals. Although no special staff was then available for this purpose, the Director of the Public Health Laboratories was placed in charge, in collaboration with the Chief Engineer of the Municipalities and Local Commissions Section of the Ministry of the Interior. These officers visited and reported on the more important supplies, and regular bacteriological examinations were made of drinking water, aerated waters, and ice in Cairo. It is stated by Mr. C. Todd, Director of the Public Health Laboratories,[1] that although a great deal has been done for the provision of water-supplies for the larger towns, much remains to be done even in Cairo and Alexandria; and that most of the smaller towns are still taking their water generally from very questionable sources. Since the beginning of 1915 regular and systematic examination has been made of the Nile water at Cairo by collecting weekly samples "from near the surface of the river in mid-stream at a point opposite the north end of Roda Island, a bottle being let down to arm's length in the river." During the period of low Nile, from January to June inclusive, the suspended solids are low (below 100 parts per million). During June or July the river begins to rise, and from July to September continues to do so, the water being charged with suspended matter amounting to 1235 parts per million (August, 1915) and even 1547 per million in August, 1917. Questions arose as to the plumbo-solvency of Nile water and the use of bleaching powder for purification purposes; its addition up to an amount corresponding to 5 parts of active chlorine per million does not increase the plumbo-solvency in the case of the Nile water, which is not unduly high and lower than that of some European city supplies. From experiments on bleaching powder dried "by passing a current of dry CO_2-free air over the powder contained in a U-tube, and immersed in an oil bath, the temperature of which was slowly raised to a maximum of just under 100° C.," it was found that this mode of drying removes practically every trace of water, leaving a powder which, *when kept dry*, undergoes practically no decomposition when maintained at as high a temperature as 45° C. for a very long period. The Jewell system of mechanical filtration is in use at Beni Suef, and is giving satisfactory results. There are two "decantation basins" (which would be better called "settling tanks" because "decant" means "to pass off gently by inclining," or tilting up the vessel containing the fluid) where alum is added, and from which the water is run on to gravel and sand filters. Samples are examined by a transparency test, which consists in noting the visibility of a platinum wire through a column of the filtered water, 1·20 metres long. This system of filtration is also in use satisfactorily at Giza, Mansura, and elsewhere. At Port Said, Suez, and Ismailia the Puech-Chabal system of sedimentation and filtration also works well. The bacterial content is reduced from 610 per c.cm. in the raw water at Port Said to 13 per c.cm. after decantation and filtration. During the war the laboratories were constantly referred to by the military authorities in regard to water-supplies for the troops in Egypt and the Sinai Peninsula. Several hundreds of these analyses and descriptions of the sources of water are collected in the present report, and form an invaluable record for future reference.

[1] Report on Egyptian Water-Supplies, Cairo, Government Press, 1920.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE.

MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.

MONDAY, August 23rd.—2 P.M., Mr. Goulden: Eye Conditions in Focal Brain Disease.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, August 23rd.—12.15 P.M., Dr. Burnford: Pathological Demonstration. 5 P.M., Mr. MacDonald: Stricture.

TUESDAY.—10.30 A.M., Surgical Registrar: Demonstration of Cases. (Surgical Wards.) 4.30 P.M., Mr. Addison: Practical Surgery.

WEDNESDAY.—10.30 A.M., Mr. MacDonald: Demonstration of Cystoscopy. 4.30 P.M., Dr. Owen: Demonstration of Medical Cases. (Lecture Room.)

THURSDAY.—12 noon, Mr. Sinclair: Abdominal Diagnosis. 4.30 P.M., Mr. B. Harman: Disorders of the Lacrymal Sac.

FRIDAY.—12.15 P.M., Dr. Burnford: Applied Pathology. 4.30 P.M., Mr. D. Buxton: Local Analgesia in Dental Cases.

SATURDAY.—12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen.

Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.

MONDAY, August 23rd, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

Communications, Letters, &c., to the Editor have been received from—

A.—Dr. S. G. Askey, Lond.; Dr. A. Abrahams, Lond.
B.—Lt.-Col. Sir J. Barrett, Melbourne; Dr. F. A. Bainbridge, Middleton-in-Teesdale; Mr. P. W. Boughton-Leigh, Arundel; British and Russian Transport Co., Lond.; Messrs. Burroughs Wellcome and Co., Lond.; Dr. J. Blomfield, Lond.; Board of Education, Lond.; Dr. H. Barber, Derby.
C.—Crystal Palace, Lond., Gen. Manager of; Dr. H. Curtis, Lond.; Sir F. Colyer, Deal; Chartered Society of Massage and Medical Gymnastics, Lond.
D.—Dr. J. N. D'Esterre, Lond., Dollard Printinghouse Dublin, Ltd., Dublin.
E.—Messrs. Evans, Sons, Lescher, and Webb, Lond.
F.—Farnborough, Medical Officer of Health of.
G.—Great Northern Central Hospital, Lond.; Dr. R. P. Garrow, Lond.; Dr. E. F. Greene, Liverpool; Dr. G. Graham, Lond.; Lt.-Col. E. Goodall, Whitchurch; Dr. T. C. Graves, Birmingham; Mr. J. E. Gurdon, Lond.
H.—Dr. A. L. Hoops, Shanklin; Prof. A. J. Hall, Sheffield.
I.—Mr. S. T. Irwin, Belfast.
L.—Dr. C. E. Lakin, Lond.; Dr. A. W. Lemarchand, Barnstaple.
M.—Dr. J. B. McDougall, Wakefield; Dr. E. H. M. Milligan, Bangor; Ministry of Health, Lond.; Dr. W. F. Menzies, Cheddleton; Ministry of Agriculture and Fisheries, Lond.; Ministry of Labour, Lond., Sec. of; Dr. W. J. McKeand, Lond.; Mr. C. C. Morley, Milford Haven; Mr. J. E. R. McDonagh, Lond.; Medical Research Council, Lond.; Mr. R. B. Marston, Lond.; Dr. T. W. Mitchell, Hadlow; Dr. W. C. Morton, Leeds.
N.—Nottingham, Medical Officer of Health of.
P.—Mr. W. H. Plows, Lond.; Dr. D. S. Pracy, Atherstone.
R.—Dr. J. A. Ryle, Lond.; Royal Sanitary Institute, Lond.; Dr. P. B. Roth, Chamonix; Royal Medical Benevolent Fund, Lond.; Dr. H. D. Rolleston, Lond.; Mr. G. Riddoch, Lond.; Royal Earlswood Institution, Redhill, Medical Superintendent of.
S.—Dr. J. H. Sequeira, Lond.; Dr. G. E. Shuttleworth, Bournemouth; Dr. R. E. Smith, Barry; St. Thomas's Hospital Medical School, Lond., Sec. of; Mr. E. J. Simmons, Southend-on-Sea; Messrs. Spottiswoode, Ballantyne and Co., Lond.; Messrs. G. Street and Co., Lond.; Prof. W. Stirling, Manchester; Mr. A. E. Shipley, Cambridge; Sanborn Co., Lond., Manager of.
T.—Dr. F. Thomson, Lond.
W.—Dr. G. Ward, Sevenoaks; West London Hospital Post-Graduate College; Mr. K. W. Walker, Lond.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2 2 0
	Six Months	1 1 0
	Three Months	0 10 6
ABROAD	One Year	£2 10 0
	Six Months	1 5 0
	Three Months	0 12 6

Subscriptions may commence at any time, and are payable in advance. Cheques and P.O.'s (crossed "London County Westminster and Parr's Bank, Covent Garden Branch") should be made payable to Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C. 2

STUDENTS' GUIDE—Session 1920-1921.

The scheme upon which the Students' Number of The Lancet is constructed will make it easy, we hope, for all who consult it to find what they seek. The General Council of Medical Education and Registration is the controlling authority of all the medical education of the country, and its responsibility for the efficiency of the Medical Register and for the maintenance of the examination standard is first explained. The student must be taught as well as examined, and as the systems under which he or she can obtain instruction do not conform to one pattern, the various curricula are described in detail, and under their respective headings the necessary information will be found concerning the facilities for medical study offered at the different teaching centres of the United Kingdom. The regulations for the examinations, both preliminary and professional, at these centres are set out so that the student desiring to obtain a medical degree from any university, or a diploma from any medical corporation, may ascertain the course of clinical instruction and the conditions under which submission for examination has to take place. The metropolitan medical schools and hospitals are grouped under the University of London, of which they are constituent bodies, although their educational opportunities are offered to other universities as well as to the medical corporations. A similar plan is adopted in dealing with the provincial universities, the hospitals in direct connexion with which are described with the universities; for though the hospitals may not be official schools of the universities they supply an integral section of the teaching required by the graduates. Upon obtaining degrees or diplomas admission to the Register follows, and greater education begins. The prudent young doctor already knows what he or she desires to make the next step, and there is a large range of choice displayed. The inducements to enter one of the Services should prevail more than they have done of recent years. An account is given of the conditions under which commissions can be obtained in the Navy, Army, Indian, and Air Force Medical Services, and in the Colonial Medical Service.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

Powers, Duties, and Constitution of the General Medical Council.

The powers and duties of the General Medical Council, or "General Council of Medical Education and Registration of the United Kingdom" to give the Council its full title, have been set out in detail in many previous Students' Numbers of The Lancet. It is first a registering body: no person, even though his qualifications have been obtained, is a legally qualified medical practitioner unless his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that the education of medical men is kept up to an efficient standard by scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner adjudged guilty of conduct "infamous in a professional respect." Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council at present consists of 38 members, of whom, as will be seen by the annexed list, all but 11 are official representatives of some corporate body. Five members are chosen by the Crown on the advice of the Privy Council, and six others are elected by the members of the medical profession as Direct Representatives.

President of the General Council: Sir Donald MacAlister. Members of the General Council: Sir Norman Moore, chosen by the Royal College of Physicians of London; Mr. Holburt Jacob Waring, F.R.C.S., Royal College of Surgeons of England; Dr. Benjamin Bloomfield Connolly, Apothecaries' Society of London; Mr. Arthur Thomson, F.R.C.S., University of Oxford; Mr. Frederick Gowland Hopkins, M.A., M.B., University of Cambridge; Dr. Robert Howden, University of Durham; Dr. Sydney Russell Wells, University of London; Dr. Henry Roy Dean, Victoria University of Manchester; Sir Harry Gilbert Barling, University of Birmingham; Dr. Richard Caton, University of Liverpool; Dr. Thomas Wardrop Griffith, University of Leeds; Dr. John Beresford Leathes, University of Sheffield; Sir Isambard Owen, University of Bristol; and Dr. David Hepburn, University of Wales. Dr. William Russell, chosen by the Royal College of Physicians of Edinburgh; Sir James William Beeman Hodsdon, Royal College of Surgeons of Edinburgh; Dr. James Alexander Adams, Royal Faculty of Physicians and Surgeons of Glasgow; Dr. H. Harvey Littlejohn, University of Edinburgh; Sir Donald MacAlister, University of Glasgow; Dr. Matthew Hay, University of Aberdeen; and Dr. John Yule Mackay, University of St. Andrews. Sir John William Moore, chosen by the Royal College of Physicians of Ireland; Sir Arthur Gerald Chance, Royal College of Surgeons in Ireland; Dr. Edward Magennis, Apothecaries' Hall of Ireland; Dr. Andrew Francis Dixon, University of Dublin; Denis Joseph Coffey, M.B., National University of Ireland; and Mr. Thomas Sinclair, F.R.C.S., Queen's University of Belfast. Nominated by His Majesty, with the advice of his Privy Council: Sir Francis Henry Champneys, Sir George Newman, Mr. Norman G. Bennett, Dr. John Christie McVail, and Dr. Edward Coey Bigger. Elected as Direct Representatives: Dr. J. A. MacDonald, Sir Thomas Jenner Verrall, Dr. Robert A. Bolam, Mr. E. B. Turner, Dr. Norman Walker, and Dr. Leonard Kidd. Treasurers of the General Council: Sir Norman Moore and Mr. Holburt J. Waring.

The Educational Curriculum.

Professional Education.—The course of professional study after registration occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

Registration and Preliminary Examination of Medical Students.—The following are the General Medical Council's Regulations in reference to the registration of students in medicine:—Every medical student should be registered in the manner prescribed by the Council. The registration of medical students is placed under the charge of the Branch Registrars. Every person desirous of being registered as a medical student should apply to the Branch Registrar of the division of the United Kingdom in which he is residing; and should produce or forward to the Branch Registrar a certificate of his having passed a preliminary examination as required by the General Medical Council, and evidence that he has attained the age of 16 years, and has commenced medical study at an institution approved by the Council. The Branch Registrar shall enter the applicant's name and other particulars in the Students' Register and shall give him a certificate of such registration. Each of the Branch Registrars shall supply to the several licensing bodies, medical schools, and hospitals, in that part of the United Kingdom of which he is registrar, a sufficient number of blank forms of application for the registration of medical students. The commencement of the course of professional study recognised by any of the qualifying bodies should not be reckoned as dating earlier than 15 days before the date of registration. In addition to the universities and schools of medicine there are many institutions where medical study may be commenced. Applications for special exceptions are dealt with by the Students' Registration Committee, which reports all such cases to the Council.

Regulations for Maintenance of Register of Medical Students.

The following examinations have been approved by the Council:—(*a*) The final examinations for the degrees in Arts and Science of any University of the United Kingdom or of the British Dominions. (*b*) All examinations which are accepted for Matriculation in the Faculties of Arts or

Pure Science in any one of the Universities of Great Britain or in the Queen's University of Belfast. (*c*) All examinations not included under the foregoing section (*b*), which are accepted for Matriculation in the Faculty of Medicine in any one of the Universities of the United Kingdom of Great Britain and Ireland provided the examination is completed at not more than two periods of examination, and that the pass-certificate (or certificates) includes English, Mathematics, Latin (or Greek or Hebrew), and at least one other subject named in the following list:—Latin, Greek, Hebrew, Arabic, Persian, French, German, Spanish, Italian, Russian, or any approved modern language. (*d*) The Council may grant special recognition to the following examinations not included under the foregoing sections (*a*), (*b*), and (*c*):—(1) The final examinations for the degrees in Arts and Science of any specially recognised Foreign University. (2) Examinations conducted by approved Examining Bodies within the United Kingdom under the provisions set forth in the foregoing section (*c*). (3) Examinations conducted by approved Examining Bodies out of the United Kingdom under the provisions set forth in the foregoing section (*c*), and under such other conditions as the Council may impose in each case.

List of Bodies whose Examinations are accepted under the Foregoing Regulations.

I. *Examinations in Great Britain.*

(1) The Matriculation Examinations in the Faculties of Arts and Science of, and all examinations accepted in lieu thereof by, the following Universities: Oxford (including Responsions and Moderations), Cambridge (including the Previous Examination and the General Examination), Durham, London, Manchester, Birmingham, Liverpool, Leeds, Sheffield, Bristol, Wales, Edinburgh, Glasgow, Aberdeen, St. Andrews. These examinations are accepted subject to the conditions set forth under Section 2 (*b*) above. (2) The Preliminary Examinations in the Faculty of Medicine of, and all examinations accepted in lieu thereof by, the Universities of Durham, Edinburgh, Glasgow, Aberdeen, St. Andrews. These examinations are accepted subject to the conditions of Section 2 (*c*) above. (3) Specially recognised Examinations conducted by approved bodies.

The following Schools Examinations have been recognised by the English Board of Education and are accepted by the General Medical Council under the conditions noted below.

AS FIRST EXAMINATIONS.

1. School Certificate Examination of the Oxford and Cambridge Schools Examination Board.
2. Senior Local Examination of the Oxford Delegacy for Local Examinations.
3. Senior Local Examination of the Cambridge Local Examinations and Lectures Syndicate.
4. School Certificate Examination of the University of Bristol.
5. First School Certificate Examination of the University of Durham.
6. General School Examination of the University of London.
7. School Certificate Examination of the Northern Universities Joint Matriculation Board.

AS SECOND EXAMINATIONS.

8. Higher Certificate Examination of the Oxford and Cambridge Schools Examination Board.
9. Higher School Certificate Examination of the Oxford Delegacy for Local Examinations.
10. Higher School Certificate Examination of the Cambridge Local Examinations and Lectures Syndicate.

(*a*) 11. Higher School Certificate Examination of the University of Bristol.

12. Higher Certificate Examination of the University of Durham.

(*a*) 13. Higher School Certificate Examination of the University of London.

14. Higher Certificate Examination of the Northern Universities Joint Matriculation Board.

(A) The First Schools Examination Certificate is accepted, provided it shows either (*a*) that English and mathematics have been passed "with credit," or (*b*) that English and a language other than English have been passed "with credit"; and also that mathematics has been passed on a "sufficient" standard. (The certificate under (*b*) must show by an explicit attestation of the examining authority that mathematics has been passed on a "sufficient" standard.)

(B) A First Schools Examination Certificate which does not fulfil one or more of the foregoing conditions is accepted, provided it is supplemented either (i.) by further Schools Examination Certificates obtained subsequently which fulfil (*a*) or (*b*); or (ii.) by certificates obtained at the Second (Higher) Schools Examination which show that the deficient subjects (English, another language, mathematics, as the case may be) have been passed (whether as "full" or as "subsidiary" subjects) at the Second Schools Examination.

Other Certificates accepted under Clause 2 (*b*). Scottish Education Department: Leaving Certificates.

Other certificates accepted under Clause 2 (*c*). Scottish Education Department: Intermediate Certificate. Central Welsh Board: Senior Certificate. University of St. Andrews: Final Examination for Diploma of L.L.A. College of Preceptors: Senior Certificate; Preliminary Examination for Medical Students Certificate. Educational Institute of Scotland: Preliminary Medical Examination Certificate.

II. *Irish Examinations.*

University of Dublin: Matriculation Examination (*a*) Junior Freshman's Term Examination (exclusive of Trigonometry); (*b*) Special Preliminary Examination to be held in March, the standard and subjects of which shall be those of a Junior Freshman Examination (exclusive of Trigonometry); (*c*) Junior Exhibition Examination on obtaining marks of sufficient merit in the subjects of (*a*) or (*b*); (*d*) Examinations for the First, Second, Third, or Fourth Year in Arts. (Certificate to be signed in the approved form by the Medical Registrar of the University.) Queen's University of Belfast: Matriculation Examination. National University of Ireland: Matriculation Examination. Intermediate Education Board of Ireland: Middle Grade Examination, with Honours in three subjects; Senior Grade Examination. Royal Colleges of Physicians and Surgeons in Ireland: Preliminary Examination. These Examinations are accepted subject to the conditions set forth in Section 2 (*c*) above.

The remainder of the curriculum, though all under the supervision of the Council, is in detail in the hands of the various degree- and diploma-granting bodies whose representatives are members of the General Medical Council. In the next pages we give the regulations of the various examining bodies, but it must always be remembered that the examinations are under the supervision of the General Medical Council, who visit the various centres in turn and closely inspect the procedure.

III. *Examinations Held Out of the United Kingdom.*

Every Certificate from Indian, Colonial, and Foreign Universities and Colleges must contain evidence that the Examination has been conducted by or under the authority of the Body granting it, must include all the subjects required by the General Medical Council, and must state that all the subjects of Examination have been passed in at not more than two examinations; copies of the form of the required Certificate are supplied by the Registrar of the Council for the purpose. In the case of Natives of India or other Oriental countries whose vernacular is other than English an Examination in a Classical Oriental Language (e.g., Sanskrit, Arabic, Chinese) may be accepted instead of an Examination in Latin. The Abiturienten-Examen of the Gymnasia and Real Schulen on the continent and the examinations entitling to the French diplomas of Bachelier ès Lettres and Bachelier ès Sciences and other corresponding Entrance Examinations to the Universities in Europe are recognised by the General Medical Council.

These examinations are accepted subject to the conditions set forth in Section 2 (*c*) above.

Further particulars are given in the Students' Regulations, which can be obtained at the offices of the Council, price 1*s*. 2*d*.

Registration of Medical Practitioners.

Under the provisions of the Medical Act, 1858, any person possessing one or other of the medical qualifications enumerated in the schedule to the Act is entitled to registration by the General Medical Council on producing to the registrar of a Branch Council proper evidence of qualification. Registration entitles him, in the words of the Act of 1886:—

"..... To practise medicine, surgery, and midwifery in the United Kingdom, and (subject to any local law) in any other part of [Her] Majesty's dominions, and to recover in due course of law in respect of such practice any expenses, charges in respect of medicaments or other appliances, or any fees to which he may be entitled ....."

These qualifications are enumerated in the Medical Register, printed each year under the direction of the Council, and the course of study necessary to obtain each of them is duly set out in the succeeding pages.

A number of diplomas granted in British possessions and in certain foreign countries entitle the holder to registration in the colonial or foreign list respectively of the Medical Register, and therefore to practise medicine within the borders of the United Kingdom. Some account of these diplomas will be given in a later issue. It should, however, be carefully noted that, where any local registration is required for legal qualification, it is essential that, before registration in the United Kingdom, evidence should be produced of registration in the country, province, or state in which the qualification was obtained.

Officers of the Council.

Norman C. King, Registrar of the General Council and of the Branch Council for England, 44, Hallam-street, Portland-place, W. 1.—T. H. Graham, O.B.E., Registrar of the Branch Council for Scotland, 20, Queen-street, Edinburgh.—Richard J. E. Roe, Registrar of the Branch Council for Ireland, 35, Dawson-street, Dublin. All communications should be addressed to "The Registrar" and not by name.

THE MEDICAL EXAMINING BODIES AND SCHOOLS OF THE UNITED KINGDOM.

A GUIDE TO THE FACILITIES FOR OBTAINING THE VARIOUS MEDICAL DEGREES AND OTHER QUALIFICATIONS FOR THE BRITISH MEDICAL REGISTER.

I.—ENGLAND AND WALES.

THE UNIVERSITIES.

UNIVERSITY OF OXFORD.

THERE are two degrees in Medicine, *B.M. and D.M.*, two degrees in Surgery, *B.Ch. and M.Ch.*, and two diplomas, *Public Health* and *Ophthalmology*.

Graduates in Arts (B.A. or M.A.) are alone eligible for the degrees. The most convenient course for the B.A. degree for intending graduates in Medicine is to take Responsions, the Preliminary Science Examinations mentioned below, and the Final Honour School of Physiology. In order to obtain the degrees of B.M. and B.Ch. the following examinations must be passed:—1. Preliminary subjects: Mechanics and Physics, Chemistry, Zoology, and Botany. 2. Professional. (*a*) First Examination: Subjects—Organic Chemistry, unless the candidate has satisfied the Examiners in Part I. Chemistry in the Natural Science School; Human Physiology, unless he has obtained a first or second class in Animal Physiology in the Natural Science School; Human Anatomy. (*b*) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology. The approximate dates of the examinations are as follows:—Preliminaries—Zoology, Botany, and Chemistry, December and June; Mechanics and Physics, March and June; Professional (First and Second B.M.), June and December.

The First Examination for the degrees of B.M. and B.Ch. may be passed as soon as the Preliminary Scientific Examinations have been completed. Anatomy and Physiology are to be passed together, and Organic Chemistry may be taken before or after these have been passed.

The Second Examination may be passed after the completion of the first, but Pathology, Hygiene, and Materia Medica and Pharmacology may be taken before or with the remaining subjects. Before admission to the Second Examination candidates must present certificates of attendance on a course of laboratory instruction in Practical Pathology and Bacteriology and of having acted as post-mortem clerk for three months, surgical dresser for six months, and clinical clerk for six months. Also they must produce certificates of instruction in Infectious and Mental Diseases, and of attendance on Labours, of proficiency in the practice of Vaccination and Anæsthetics, and of having attended a course of Practical Pharmacology. Also in respect of the First Examination candidates must present certificates showing that they have dissected the whole body once and have attended courses of laboratory instruction in Practical Histology and Practical Physiology.

The degree of D.M. is granted to Bachelors of Medicine of the University provided they have entered their thirtieth term and have composed on some medical subject a dissertation which is approved by the professors in the Faculty of Medicine and examiners for the degree of B.M. whose subject is dealt with. The degree of M.Ch. is granted to Bachelors of Surgery of the University who have entered their twenty-first term, who are members of the surgical staff of a recognised hospital, or have acted as Dresser or House Surgeon in such a hospital for six months, and who have passed the M.Ch. examination in Surgery, Surgical Anatomy, and Surgical Operations. This examination is held annually, in June, at the end of the Second B.M. Examination.

Diploma in Ophthalmology, the examination is held in July; *Diploma in Public Health*, in June and November.[1]

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for three years and is of the annual value of £200. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Radcliffe Library, University Museum. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially for research in some branch of medical science. The Theodore Williams Scholarships of the value of £50 each are awarded annually in the subjects of Anatomy, Physiology, and Pathology. A King's College Hospital Burney Yeo Scholarship of £80 is awarded each year. The Scholarships in Science which are offered by several Colleges are open to those who intend to pursue Medicine. The value of these scholarships is usually £80 a year for four years.

In addition to the University lectures and classes the several Colleges provide their undergraduates with tuition for all examinations up to the B.A. degree.

In the Radcliffe Infirmary and County Hospital clinical instruction is given by the Regius Professor of Medicine, the Litchfield Lecturers in Medicine and Surgery, and the other physicians and surgeons. Instruction is also given in post-mortem work and Clinical Pathology in connexion with the courses in Pathology. Post-graduate courses will be held at the beginning of October.

More detailed information may be obtained from the University Calendar; from the Examination Statutes, 1918 (both of which are published by the Clarendon Press); from the Regius Professor of Medicine; and from the Professors in the several departments of medical science.

UNIVERSITY OF OXFORD: RADCLIFFE INFIRMARY AND COUNTY HOSPITAL.—Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) Clinical lectures by the Litchfield Lecturers in Medicine and Surgery; and (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation. (4) Pathological demonstrations and instruction in post-mortem work are given by the Assistant Pathologist. Practical Pharmacy is taught in the Radcliffe Dispensary. Opportunities are offered to students who wish to act as surgical dressers and clerks. The Hospital contains 210 beds.

UNIVERSITY OF CAMBRIDGE.

The student must enter at one of the Colleges, or as a non-collegiate student, and keep nine terms (three years) by residence in the University. He must pass the Previous Examination in Classics, Mathematics, &c., if possible, before he comes into residence in October, or he may obtain exemption through the Oxford and Cambridge Schools Examination Board, the Oxford or Cambridge Senior Local Examinations, the London Matriculation Examination, the Scotch Education Department, Responsions at Oxford, and the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield, the Matriculation Examination of the University of Birmingham, or by being graduates of certain other Universities in the United Kingdom. He may then devote himself to medical study in the University, &c. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing either (*a*) the General Examination and one Special Examination, or (*b*) two Special Examinations for the ordinary B.A. degree, or an Honours degree in one of the Triposes. The Natural Sciences Tripos is taken most frequently, as some of the subjects are practically the same as those for the first and second M.B.

For the degree of *Bachelor of Medicine* (*M.B.*) five years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three or four years are usually spent in Cambridge till he has passed, say, the examination for Part I. of the Natural Sciences Tripos and the first and second examinations for M.B. Hospital practice and many of the requisite lectures may be attended in Cambridge, and some students remain to attend lectures and hospital practice until they

[1] The regulations for the Diplomas in Public Health and Sanitary Science of the various Examining Bodies will be found on p. 473.

have passed the second part of the second examination for M.B. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The *first* includes (1) Chemistry, (2) Physics, and (3) Elementary Biology. These parts may be taken together or separately. The *second* is divided into two parts—viz., (1) Human Anatomy and Physiology; and (2) Pharmacology and General Pathology. The *third* is also divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept in the Public Schools, by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic.

Candidates who have passed both parts of the third M.B. examination are admitted to the registrable degree of *Bachelor of Surgery* (*B.Ch.*) without separate examination and without keeping an Act.

The degree of *Doctor of Medicine* (*M.D.*) may be taken three years after that of M.B. or four years after that of M.A. The candidate is required to produce certificates of having been engaged in Medical Study for five years, and if an M.A., to pass the same examinations as are required for the degree of M.B. An Act has to be kept, consisting of an original Thesis sustained in the Public Schools with *vivâ voce* examination; and a short extempore essay has to be written on a topic taken from the general subject of his thesis, whether it be Physiology, Pathology, Pharmacology, the Practice of Medicine, State Medicine, or the History of Medicine.

For the degree of *Master of Surgery* (*M.Ch.*) the candidate must have passed all the examinations for B.Ch., or, if he is an M.A., have obtained some other registrable qualification in surgery. He is required either (1) to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject; or (2) to submit to the Medical Board original contributions to the advancement of the Science or Art of Surgery. Before he can be admitted to the examination two years at least must have elapsed from the time when he completed all required for the degree of B.Ch. Before submitting original contributions he must have been qualified at least three years.

Diplomas are granted in Medical Radiology and Electrology, and in Psychological Medicine. Candidates must hold a recognised medical qualification.

Women Students.—Increased facilities have been offered to students of Girton and Newnham Colleges, and they are admitted to the First and Second M.B. Examinations under certain conditions.

University Prize in Medicine.—The one University Prize in Medicine, the Raymond Horton Smith Prize (value £19), is awarded to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a tripos examination. Medical Studies are endowed by the numerous Natural Science scholarships at the various colleges, information about which can be obtained from the respective Tutors.

An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Physics, Biology, Pharmacology, and General Pathology may be obtained upon sending a stamped directed envelope to the Registrary, the Registry, Cambridge.

ADDENBROOKE'S HOSPITAL.—Clinical Lectures in Medicine and Surgery, in connexion with Cambridge University Medical School, are given at this hospital twice a week during the academical year; and practical instruction in Medicine and Surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations. The fee for pupilship is 3 guineas a term. All communications by students should be made to Dr. Aldren Wright.

UNIVERSITY OF LONDON.

The University of London was established by Royal Charter in 1836 as an examining and degree conferring body with affiliated colleges but no direct teaching functions. In 1900 it was reconstituted under the Act of Parliament 1898 and became a teaching as well as an examining body. Many schools already existing became constituent colleges, including all the metropolitan medical schools. Lecturers were also appointed in special subjects.

Teaching Staff.—The teaching staff of the University is organised under two heads: 1. Appointed teachers—i.e., such as are appointed by, and are paid out of the funds of, the University. 2. Recognised teachers—i.e., those who have been appointed and are paid by the several schools of the University and other institutions at which instruction is given under the auspices of the University, and who have been recognised by the Senate as conducting work of University standard. Courses by non-recognised teachers may also be approved in schools of the University. The lecturers in the Medical Sciences and the professors in the Faculties of Medicine in University College, London, and King's College, London, will be found enumerated under their respective schools.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who have matriculated at the University and who are pursuing a course of study approved by the University, either (*a*) under the direct control of the University or a committee appointed thereby; or (*b*) under one or more of the appointed or recognised teachers of the University. Centres for preliminary and intermediate medical studies have been established by the University at University and King's Colleges. Internal students must pursue their studies at one of the above centres, or at one of the medical schools connected with the University. These are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. The London School of Tropical Medicine and the Lister Institute of Preventive Medicine are also recognised as schools of the University in special departments. External students are all other matriculated students, and may pursue their studies at other universities and medical schools, presenting themselves for examination at the University.

Faculty of Medicine.—The Faculty of Medicine grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), and the higher separate degees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*).

The curriculum for the Bachelor's degrees is now five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University, to be obtained from the Principal Officer, University of London, South Kensington, S.W. 7, and the examinations formerly known as the Preliminary Scientific, the Intermediate, and the Final Examination in Medicine are now respectively entitled the First, Second, and Third Examinations for Medical Degrees. Part II. of the former Preliminary Scientific Examination has now been made Part I. of the Second Examination.

A. *Internal Students.*—In order to be admitted to the Bachelor's degrees a student must normally, after registration as an internal student, have: (1) Attended prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (*a*) The First Examination for Medical Degrees in Inorganic Chemistry, Physics, and General Biology; (*b*) the Second Examination for Medical Degrees: Part I., Organic and Applied Chemistry; Part II., Anatomy, Physiology, and Pharmacology, including Pharmacy and Materia Medica; (*c*) the Third Examination for Medical Degrees, or M.B., B.S. Examination; Medicine and Surgery, Midwifery and Diseases of Women, Pathology, Forensic Medicine and Hygiene.

B. *External Students.*—To be admitted to the Bachelor's degrees an external student must (1) have passed the Matriculation examination or have been exempted therefrom under Statute 116 not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to Matriculation and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools.

The First Examination for Medical Degrees (Inorganic Chemistry, Physics, and General Biology) will take place twice in each year, commencing on the Monday following Dec. 7th and on the second Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (Part I.): Organic and Applied Chemistry.—This examination will take place twice in each year, commencing on the Wednesday following the third Monday in March and on the afternoon of the Thursday following the second Monday in July. No candidate will be admitted to this examination within six months of having passed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. The subjects of the examination are Anatomy, Physiology, and Pharmacology, including Pharmacy and Materia Medica. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the fourth Monday in October and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part. II. (1) Principles and Practice of Medicine; (2) Clinical Methods and Physical Diagnosis; (3) Insanity (with clinical demonstrations at a recognised Asylum); (4) Therapeutics; (5) Vaccination; (6) Principles and Practice of Surgery; (7) Operative Surgery, Surgical Anatomy, Practical Surgery, and the Administration of Anæsthetics; (8) Diseases of the Eye, Ear, Throat, and Skin; (9) Lectures and Demonstrations on Midwifery and Diseases of Women; (10) Practical Midwifery, the conduct of at least 20 Labours, and practice as a Clinical clerk in Gynæcological work; (11) Pathology and Bacteriology; (12) work of the Post-mortem room; (13) Forensic Medicine; and (14) Hygiene. He must also have attended the Medical and Surgical practice of a recognised hospital for two years and a course of instruction at a recognised Fever Hospital for two months. He must have had clinical instruction and must have held the posts of medical clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine (including Therapeutics and Mental Diseases), Pathology, Forensic Medicine and Hygiene, Surgery, Midwifery, and Diseases of Women. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Midwifery, and Diseases of Women. These groups may be taken either separately or together. The list of candidates who have passed will be published in two parts—namely, an Honours list and a Pass list. Bachelors of Medicine of this University who graduated in or before May, 1904, may obtain the B.S. degree by passing the Surgical part of the M.B., B.S. examination.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches, namely: (1) Medicine; (2) Pathology; (3) Mental Diseases; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. may transmit to the Registrar a thesis or published work having definite relation to the branch of Medicine in which he is a candidate, and if the thesis be approved by the examiners the candidate may be exempted from a part or from the whole of the written examination in that subject.

Master in Surgery.—The examination for the degree of Master in Surgery takes place twice in each year and commences on the first Monday in December and on the first Monday in July.

Fees.—Matriculation £2 2*s.* for each entry. At provincial examinations an additional local fee is charged. First examination for Medical Degrees: £6 6*s.* for each entry to the entire examination. For re-examination in one subject the fee is £2 2*s.* In the second examination, Part I. £2 2*s.*, repeated on each subsequent entry; Part II. £8 8*s.* for the whole examination. Third examination: £10 10*s.* for each entry to the whole examination. M.D. Examination: £21; for re-examination £10 10*s.* M.S. Examination: As for M.D.

Full details of the prescribed curricula of study and the names of the recognised Internal and External Schools of the University, can be obtained free on application to the Principal Officer, University of London, South Kensington, S.W.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 for convalescent patients at Swanley. It receives over 8000 in-patients annually and its out-patients and casualties amount to more than 75,000 annually. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electro-therapeutics and X Ray work. Surgical operations take place every day at 1.30 P.M. and Surgical Consultations are held on Thursdays at the same hour. Medical Consultations are held on Thursdays at 3.15 P.M. The physicians and surgeons deliver clinical lectures weekly during both the winter and the summer sessions. Clinical Lectures on all special subjects are also given. The visits of the physicians and surgeons are made at 1.30.

Ten house physicians and ten house surgeons are appointed annually, and are provided with rooms and board by the hospital authorities and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear are appointed every six months, and are provided with rooms and board and receive a salary of £80 a year. Three resident anæsthetists are appointed annually, and receive salaries of £120, £100, and £100 respectively, with rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential college is attached to the hospital.

New Buildings.—The new buildings comprise residential quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. A new chemical laboratory has been added to the Medical School, and a laboratory devoted to instruction in Public Health. A second new block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, pathological histology, and pathological chemistry. *The Medical School Buildings* include three large lecture theatres, a large dissecting room, a spacious library (containing 13,000 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is the most complete in the kingdom. There are laboratories for chemistry, physiology, pharmacology, physics, public health, and biology, giving ample accommodation in every department.

Special Classes for the Primary and Final F.R.C.S. are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. *Laboratory Instruction for the D.P.H.* is provided during the winter and summer sessions.

[1] For Ancillary Metropolitan Medical Schools see p. 447.

The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Scholarships given in aid of Medical Study.—At this school various Scholarships, prizes, &c., are given. For five of the Scholarships and the Exhibition—namely, (*a*), (*b*), two Entrance Scholarships of the respective values of £75 and £100; (*c*) Entrance Scholarship in Arts, £100; (*d*) Jeaffreson Exhibition, £50; and (*e*) Shuter Scholarship, £50—a full or University course at St. Bartholomew's Hospital is required. The awards of (*a*), and (*b*) are made after examination in selections from the subjects of Chemistry, Physics, Zoology, Botany, Physiology, and Anatomy; (*c*) and (*d*) are awarded after examination in Latin, Mathematics, and Greek or French or German; (*e*) is awarded after competitive examination among Cambridge Graduates in Anatomy and Physiology. The remaining Scholarships and prizes are as follows:—Four Junior Scholarships: (*f*) No. 1, £30, Anatomy and Physiology; (*g*) No. 2, £20, Anatomy and Physiology; (*h*) No. 3, £25, Chemistry, Physics, and Biology; (*i*) No. 4, £15, Chemistry, Physics, and Biology; (*j*) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (*k*) Kirkes Scholarship, £30 and medal, Clinical Medicine; (*l*) and (*m*) two Brackenbury Scholarships, £39 each, one in Medicine and one in Surgery; (*n*) Sir G. Burrows Prize, £10, Pathology; (*o*) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; (*p*) Matthews Duncan Medal and Prize, £20, Midwifery and Gynæcology; (*q*) Luther Holden Research Scholarship in Surgery, awarded by election, £105; and (*r*) Lawrence Research Scholarship and gold medal in Pathology, awarded by election, £115.

Information may be obtained on application to the Dean to the Medical School: Dr. T. W. Shore. The Warden of the College is Mr. W. Girling Ball.

CHARING CROSS HOSPITAL.—The Hospital, to which the School is attached, contains 300 beds. Over 3000 cases pass through its wards each year, and some 24,000 out-patients and casualties are treated. There are special departments for Mental Diseases, Midwifery, Diseases of Women, of Children, of the Skin, Eye, Ear, Throat, Nose, and Teeth, for Orthopædic Cases, X Ray work, and for Electrical Examination and Treatment.

Appointments.—In the Medical School Demonstratorships and Assistant Demonstratorships are open to students of the School. Medical, Surgical, and Obstetric Registrars to the Hospital are appointed annually. Six House Physicians, six House Surgeons, and two Resident Obstetric Officers are appointed each year after competitive examination.

Primary and Intermediate Studies.—By an agreement with the University of London the School sends its Primary and Intermediate Students to receive their lectures and practical work at King's College, which is situated within four minutes' walk. This arrangement has proved successful.

Final Studies.—These are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged to cover all the subjects necessary for qualifying examinations. Departments are also available for other final subjects of Materia Medica, Toxicology, and Operative Surgery.

An Institute of Pathology with a whole-time staff of scientific workers and fully equipped Laboratories has been established in the School. Students receive their training in Preventive Medicine, Pathology, and Bacteriology here, and are encouraged to undertake Research. Special facilities for Post-graduate Research and Study.

The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital. Special lectures and demonstrations are arranged for Post-graduates.

The *Museum* contains over 4000 specimens, including a notable collection of over 800 gynæcological specimens, "The Cuthbert Lockyer Collection."

Students' Club.—The social comfort and convenience of students are met by library, reading, and smoking-rooms, refreshment-room, &c. The Club, which is under the control of a Committee of Students, provides needful athletic recreation, and includes the Medical Society.

Women Students.—Women students are accepted by the School and Hospital upon the same terms and conditions as men, and after qualification are eligible for resident Hospital appointments. A separate common-room and a female attendant are provided, but beyond this no further distinction is made. This system of co-education, under which men and women are placed on terms of complete equality throughout the whole of the curriculum, has been found to work successfully and to their mutual advantage.

Fees.—An entrance fee of 10 guineas and 8 guineas is payable by full-course and final-course students respectively, and an annual fee of 35 guineas covers all other expenditure, with the exception of 7 guineas for vaccination, dispensing, and fever hospital attendance, which must be taken outside the hospital. Membership of the Students' Club is included in these fees.

Further information may be obtained on application to the Dean, Dr. W. J. Fenton, Medical School, Charing Cross Hospital, London, W.C.

ST. GEORGE'S HOSPITAL.—This hospital has a service of 436 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. One ward is set apart for Diseases Peculiar to Women. Children's beds are placed in all the women's wards. Two wards are allotted to ophthalmic cases.

Entrance Scholarships and Endowed Prizes of a total value of £576 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the University of London for students who enter during the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at either University College or King's College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to Clinical work.

Eight house physicians and eight house surgeons are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £350 per annum each; Medical Registrarship at £200 per annum; Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £50; the post of Resident Anæsthetist at £100; the posts (2) of Senior Anæsthetists at £50; the posts (2) of Junior Anæsthetists, each at £30. The St. George's Hospital Club, with smoking- and luncheon-rooms on the hospital premises, and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the chess, lawn tennis, boxing, hockey, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Scholarships and Prizes.—At this school two entrance scholarships are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two University Entrance Scholarships, 70 guineas and £50 respectively, Anatomy and Physiology. The others are as follows: (*c*) William Brown Exhibition, tenable for two years and open to perpetual pupils having registrable qualifications, £135 per annum, Practice of Medicine, Midwifery, and Surgery; (*d*) William Brown Exhibition, tenable for three years and open to perpetual pupils qualified not more than three years previously, £45 per annum, Essay and Original Work; (*e*) Allingham Scholarship in Surgery for Students qualified not more than three years, £60, Competitive Essay; (*f*) and (*g*) two Brackenbury Prizes, one in Medicine and one in Surgery, £30 each, open to students of not more than five years' standing; (*h*) H. C. Johnson Memorial Prize, £15, Practical Anatomy; (*i*) Pollock Prize, £17, Physiology, Physiological Chemistry, and Histology; (*j*) Clarke Prize, £5; (*k*) Thompson Medal, £5, Clinical Reports; (*l*) Brodie Prize, £7, Clinical Reports; (*m*) Webb Prize, open to perpetual pupils, £30, Bacteriology; (*n*) Sir Francis Laking Memorial Prize, £65, open to students having registrable qualifications.

Further information may be obtained from the Dean of the Medical School, Mr. R. R. James.

GUY'S HOSPITAL.—This hospital, founded by Thomas Guy in 1721 for the reception of 400 patients, and enlarged through the aid of a large bequest from the late William Hunt, contains at the present time 644 beds. The

school buildings have been rebuilt and now offer very complete accommodation. Within the grounds of the hospital are situated the residential college, with accommodation for 60 students, the students' club, with reading, smoking, luncheon, and dining-rooms, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 20 minutes from the hospital.

House physicians, house surgeons, out-patient officers and assistant house surgeons, obstetric residents, ophthalmic house surgeons, clinical assistants, clerks to anæsthetists, surgeons' dressers, medical clinical clerks, post-mortem clerks, extern obstetric attendants, and dressers and clerks in the special departments are appointed from among the students upon the recommendation of the Medical Council according to merit. The establishment of a Venereal Clinic, in accordance with the Scheme of the Local Government Board and London County Council. Lectures and clinical instruction are given, to which Medical Students and Practitioners are admitted without fee.

A Post-graduate Course is held in connexion with the Fellowship of Medicine.

The following new Clinics have been opened: Salomon's Welfare Centre (for Maternity and Children), Tuberculosis Department, and V.D. Department.

Scholarships.—Seven entrance scholarships are awarded annually as follows:—(*a*) one War Memorial scholarship, providing a free Medical Education for five years—the annual value is about £40, to be awarded either in Arts or in Science, according to the discretion of the Examiners and to the percentage of the marks obtained; (*b*) one Arts scholarship of £100 for students under 21 years of age, Latin, English, Greek or French or German, Arithmetic, Euclid, and Algebra; (*c*) one Science scholarship for students under 21 years, £120, Inorganic Chemistry, Physics, and Biology; (*d*) a Scholarship of £50, open to candidates under 21 years of age, to be awarded either in Arts or in Science, according to the discretion of the Examiners, and to the percentage of the marks obtained; (*e*) three scholarships, one of £80, one of £75, and one of £35, for students under 25 years of age who have completed the curriculum for, or passed the examination in, Anatomy and Physiology for a medical degree in any University of the British Empire, and have not entered as students in any Metropolitan Medical School. Subjects: Any two of the following: Anatomy, Physiology, Pharmacology, General Pathology, Organic Chemistry.

In agreement with the practice of the Universities, an allowance will be made (1) for Military Service performed by candidates, the term "military service" meaning service in the Naval or Military Forces of His Majesty or of His Majesty's Allies during the war; or (2) in respect of other approved duties in connexion with national defence.

The Dean of the Medical School is Professor T. B. Johnston, from whom further information may be obtained.

UNIVERSITY OF LONDON: KING'S COLLEGE.—The medical department (Faculty of Science, Medical Division) at this College only deals with Preliminary and Intermediate subjects, and instruction in these subjects is given in the College laboratories by university professors and their assistants. The following four hospital schools prepare their students only for the final examinations—viz., King's College Hospital, Westminster Hospital, St. George's Hospital, and Charing Cross Hospital—sending them to King's College for the earlier part of the curriculum. The department is open to both men and women.

Fees.—(*a*) Entrance fee, £6. (*b*) Tuition fee of 12 guineas per term, or a composition fee of 35 guineas per annum if paid at the commencement of the session, or a composition fee of 100 guineas for the three years' course if paid at the commencement of the course. For prospectus and further information application should be made to the Dean of the department (Professor E. Barclay-Smith).

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—The advanced subjects in the curriculum are dealt with at the Medical School attached to King's College Hospital, which is situated at Denmark Hill, S.E. The hospital stands in the midst of a South London population, from which an immense amount of clinical material is forthcoming. During the past year there were 174,626 attendances in the out-patient and casualty departments. There are 400 beds available for in-patients, and provision will ultimately be made for 600 beds. There are special departments for Bacteriology, Children, Clinical Pathology, Dermatology, Gynæcology and Obstetrics, Laryngology, Massage, Neurology, Odontology, Ophthalmology, Orthopædics, Otology, Physicotherapy, Psychological Medicine, Radiology, Rhinology, and Urology, each in charge of a specialist and his staff. Clinics are also held in applied pharmacology, cardiology, and medical chemistry. The appointments open to students are those of senior clinical assistant to the special departments; medical, surgical, and obstetric tutorships; resident casualty officers; resident anæsthetist; bacteriologist; clinical pathologist; pathological registrar; and medical, surgical, and obstetric registrarships. Fifteen resident medical and surgical officers are appointed half-yearly.

Scholarships and Prizes.—For the first two scholarships in the list here shown a complete course at King's College is required. The money value and subjects of examination are as follows:—(*a*) Two Warneford Scholarships, tenable for four years, £25 each per annum; (*b*) Sambrooke Scholarship, £50; (*c*) Rabbeth Scholarship, £20; (*d*) Medical Entrance Scholarships, £50, Anatomy and Physiology, and, £50, Pathology and Pharmacology, open to students who (1) propose to take a degree at any British University, and have passed their University examination in Biology, Chemistry, and Physics, and who (2) will become students at King's College Hospital from date of entering upon Scholarship; (*e*) Two Medical Entrance Scholarships one in Arts and one in Science, £50 each, tenable for five years, successful candidates to study at King's College and King's College Hospital; (*f*) Three Medical Scholarships, £40 for fifth-year students, £20 for third-year students, and £20 for second-year students; (*g*) Two Sambrooke Registrarships, open to matriculated students who have filled certain appointments in hospital, £50 each; (*h*) Carter Prize, £15, Botany; (*i*) Tanner Prize, £10, Obstetrics and Diseases of Women; (*j*) Todd Prize, £4 4*s*. and medal, Clinical Medicine; (*k*) Two Burney Yeo Entrance Scholarships, £80 each, open to students of Oxford and Cambridge on the nomination of the Regius Professors.

Athletics.—The King's College Hospital Clubs and Societies Union was formed in 1908, and consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. Admirable playing fields, over six acres in extent, have been provided for the use of the students on Dog Kennel Hill, Lordship-lane, S.E., about ten minutes' walk from the hospital. There are also Tennis Courts in the grounds of the Hospital and of "The Platanes," the hall of residence for students belonging to the hospital.

Fees.—The composition fee for Hospital work and Final subjects of the curriculum is 93 guineas if paid in one sum, or 95 guineas if paid in two instalments, in addition to the Entrance Fee of 10 guineas. Dean: Dr. H. Willoughby Lyle. Secretary of the Medical School: Mr. S. C. Ranner, King's College Hospital, Denmark Hill, S.E. 5.

LONDON HOSPITAL.—The hospital, with its Medical College and Dental School, is situated in the Mile End-road, E. The hospital contains 933 beds, which are in constant use, and is the only general hospital for East London. During last year 19,699 in-patients and 118,685 out-patients received treatment, while 7793 major operations were performed. 37,006 out-patients attended the special departments for diseases of the Eye, Ear, Nose and Throat, Skin, Teeth, &c., and the Obstetric, Orthopædic, Venereal, Radiographic, Electro- and Physico-Therapeutical and Inoculation Departments. The hospital presents, therefore, a large field for clinical instruction, and in its Wards and Out-patient Departments exceptional opportunities are afforded for acquiring an extensive and practical experience in all phases of disease.

The Clinical Units in Medicine and Surgery coördinate the teaching of their subjects in the Hospital. The directors and their assistants give practical instruction in Elementary Clinical Medicine and Surgery to all students before they are allowed to enter the Wards and Out-Patient Department. Senior Students are encouraged to work with the units. special courses of lectures and demonstrations are arranged in Medicine and Surgery and their ancillary subjects. Opportunities for research will be provided under the supervision of the staffs of the units.

Owing to the large number of patients more appointments are open to students before and after qualification than at any other hospital. Holders of resident appointments have free board. Special classes are held for the examinations of the University of London, for the Fellowship of the Royal College of Surgeons, and for other higher examinations. Special entries for medical and surgical practice can be made. A residential Hostel on hospital grounds is provided for the convenience of students. The Clubs Union Athletic Ground of over 13 acres is within easy reach of the hospital.

Scholarships and Prizes.—At this school the successful candidates for the first items in the list here shown must enter for the course subsequent to passing the first examination in Biology, Chemistry, and Physics. The value and the subjects of examination are as follows:—Price Scholarship £100, and one Entrance Scholarship of £50, subjects of First Medical Examination at the University of London; Epsom College Scholarship, free education, subjects of First Medical Examination as above; Price Scholarship, open to students of Oxford and Cambridge Universities, £52 10*s.*, Human Anatomy and Physiology; Buxton Scholarship, £31 10*s.*, subjects of Anatomy and Physiology; three Scholarships for Clinical Work, £20 each, Medicine, Surgery, and Obstetrics and Gynæcology; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine, and Surgery; Letheby Prizes (2), £25, Chemistry and Chemical Pathology; eight Dressers' Prizes, amounting to £40, zeal, efficiency, and knowledge of Elementary Clinical and Minor Surgery; Hutchinson Prize, triennial, £40, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 respectively; Andrew Clark Prize, biennial, £26, Clinical Medicine and Pathology; James Anderson Prizes, £9, Elementary Clinical Medicine; Forensic Medicine; Arnold Thompson Prize, £15, Medical and Surgical Diseases of Children: and Liddle Prize, triennial, £120.

Medical Research Funds.—Research Funds of over £26,000, including the Eliza Ann Alston Endowment Fund for Medical Research, provide valuable scholarships for men wishing to undertake research or desirous of preparing Theses for University degrees.

Dean: Professor William Wright, London Hospital Medical College, E.

ST. MARY'S HOSPITAL.—305 beds. The number of in-patients treated during 1919 was 3591. The number of out-patients was 15,833 with 21,802 casualty cases, a total of 37,635. The situation of the hospital and Medical School in the centre of the residential districts of Paddington, Bayswater, and North Kensington renders it exceptionally convenient for students' rooms, a register of which is kept by the authorities for the use of students.

Laboratories, &c.—The Medical School provides for the entire curriculum. Special laboratories are in use for Biology, Chemistry, and Physics, a series of lecture theatres and laboratories for Anatomy and Physiology, and a spacious and well-lighted dissecting-room. The Pathological Department is under the direction of Dr. E. H. Kettle, and a block of consulting-rooms and laboratories in the New Wing of the Hospital has been equipped for the department of Therapeutic Inoculation.

Appointments.—All clinical appointments in the hospital are free to students of the Medical School and the resident medical officers are chosen by competitive examination. Six house physicians, six house surgeons, four obstetric officers are appointed in each year and receive board and lodging in the hospital. Two resident anæsthetists are appointed in each year and receive a salary at the rate of £100 per annum, with board and lodging. Four casualty house surgeons are appointed in each year upon the same conditions. Several assistants in the department of Therapeutic Inoculation are appointed annually at salaries of £100 per annum and upwards. In addition to the above, the senior appointments, medical, surgical, and obstetric registrar, casualty physician, demonstrator of anatomy, physiology, and biology, are made annually.

Clinical Facilities.—The clinical teaching has recently been greatly extended by the introduction of Clinical Units in Medicine and Surgery, and by the affiliation, for teaching purposes, of the Paddington Infirmary, Paddington Green Children's Hospital, and Maida Vale Hospital for Nervous Diseases, bringing up the total number of beds available for teaching purposes to more than 1000.

Clubs, &c.—The amalgamated clubs include all the various athletic clubs, as well as the Medical Society, &c. There is a students' club on the Hospital premises, the membership of which is included in the amalgamated clubs.

A new athletic ground (10 acres) has been obtained at Wembley and is now in use.

Special Tuition.—Special tuition is provided for the Intermediate and Final Examinations of the Universities of Oxford, Cambridge, and London, and for the Primary and Final F.R.C.S.

The composition fee for full students is £200 if paid in one sum, or £210 if paid in four instalments. University students who have completed their examinations in Anatomy and Physiology are admitted on payment of a composition fee of 90 guineas paid in one sum or by payment of two annual instalments of 50 guineas and 45 guineas respectively. A system of annual fees is also in force as an alternative to composition fees. Separate courses of lectures, laboratory work, or hospital practice may be taken.

Scholarships and Prizes.—The money value and subjects of examination of these are as follows: (*a*) and (*b*) Entrance Scholarships in Natural Science, £100 and £50 respectively, awarded by competition in September; (*c*) the Frederic John Palmer Scholarship in Natural Science, £25; (*d*) University Scholarship in Natural Science, open to members of Oxford or Cambridge University, £52 10*s.*; (*e*) University Scholarship in Natural Science, open to members of any British University, £52 10*s.*; (*f*) Epsom Scholarship, awarded by nomination, £52 10*s.*; (*g*) Gold Medal, £20, an Essay on Some Special Point in Clinical Medicine; (*h*) Meadows' Prize, awarded in alternate years, £8, Obstetrics; (*i*) Wallace Memorial Prize and Medal, for work in Vaccine Therapy, £5 5*s.*; (*j*) David Lees Prize in Clinical Medicine, £8; (*k*) Sir William Broadbent Prize in Clinical Medicine, £8.

Dean: Sir John Broadbent, M.D. Secretary: Mr. B. E. Matthews, St. Mary's Hospital Medical School, Paddington, W.

MIDDLESEX HOSPITAL.—The Hospital contains over 450 beds, with special wards for Cancer, Maternity, and Gynæcological and Ophthalmological cases, and for Diseases of Children. The Cancer Charity, containing 92 beds and Special Investigation Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects.

In the Electro-Therapeutic Department (under the direction of the Professor of Radiology) students obtain instruction in the Treatment of Lupus and Cancer by the X Ray method of treatment. An Electrocardiograph Department is also established.

The Medical School, which now includes the Bland-Sutton Institute of Pathology and the Cancer Research Laboratories is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, and for the Diplomas in Public Health, for which two courses are held yearly, commencing in April and October. Ample laboratory and class-room accommodation is provided. The teaching staff includes 6 Professors, 29 recognised Teachers, 6 Demonstrators, 3 Tutors.

The Bland-Sutton Institute of Pathology is completely equipped for routine investigation, teaching and research work, and contains a new lecture theatre and large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility for study.

Other features of interest are: The institution of a course in Medical Radiology and Electrology, under the direction of the Professors of Radiology and Physics. The D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone, will commence on Oct. 1st. Primary F.R.C.S. class will resume on Sept. 1st. Final F.R.C.S. class begins on Sept. 1st.

Special classes are held to prepare students for the Intermediate examinations of the Universities. There is a Residential College in the hospital for students.

Hospital Appointments.—All appointments are made without fee of any kind, and the following are appointed at intervals annually: six house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, one resident anæsthetist, and two resident officers to the

special departments. The medical and surgical casualty officers are appointed twice a year. The medical, surgical, and obstetric and gynæcological registrars are appointed as vacancies arise.

Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department.

Scholarships, Prizes, &c.—(*a*), (*b*), and (*c*) Three Entrance Scholarships, value £100, £50, and £25, and (*d*) a University Scholarship, value £50, are awarded annually in September. The successful candidates are required to become general students of the school. (*e*) A Freer Lucas Scholarship for Foundationers or Council Exhibitioners of Epsom College is awarded annually on the nomination of the Headmaster. There are also, (*f*) and (*g*), two Broderip Scholarships, value £60 and £40 respectively; (*h*) the Lyell Gold Medal and Scholarship, value £55 5*s.*; (*i*) the John Murray Medal and Scholarship, value £25 (awarded every third year); (*k*) the Freeman Scholarship, value £30; (*l*) the Hetley Clinical Prize, value £25; (*m*) the Leopold Hudson Prize, value 11 guineas; and (*n*) the Second Year's Exhibition, value 10 guineas. There are also numerous class prize examinations.

In connexion with the Cancer Research Department the following Scholarships are awarded:—Richard Hollins Research Scholarship, value £100; Walter Emden Scholarship, value £100; and a Cancer Research Scholarship, value £60.

Fees.—The fees are arranged on a basis of an annual payment of £42 for the five years of the curriculum. After five years, if the student is not qualified, the annual fee is £21.

The Amalgamated Students' Club includes the following: the Medical Society, the Common Room Society, the cricket club, the football clubs, the athletic club, the rowing club, the musical society, the chess club, the lawn tennis club, and the hockey club. A subscription to the Amalgamated Students' Club is payable by all General and Dental students. Full particulars on application to the Dean, Middlesex Hospital Medical School, W. 1.

ST. THOMAS'S HOSPITAL.—This hospital received its present charter from King Edward VI., but as a monastic institution was in existence prior to the year 1207. The building occupies a unique position by the river, opposite the Houses of Parliament, and contains 632 beds. The in-patients last year numbered 7687, whilst the number of attendances as out-patients, including the casualty and light departments, was 331,278. There are special departments for the treatment of women, children, the eye, ear, nose and throat, skin, and teeth. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction. The Venereal Department has been established as part of the London County Council scheme. Departments for light treatment, X rays, and the Physicotherapeutic Department are also special features. A speech clinic has been inaugurated in connexion with the Children's Department. Exceptional facilities are offered in the hospital laboratories for the study of general pathology, clinical pathology, chemical pathology, cardiology, and of treatment by serums and vaccines. Surgical operations take place in the main theatres every day except Saturdays at 2 P.M. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week. Clinical lectures are delivered every Wednesday during the sessions. All appointments in the hospital are open to students without extra fee. Clinical assistants to all the special departments are appointed every three months. A resident assistant physician and a resident assistant surgeon, at a salary of £200 each, are appointed biennially; also four hospital registrars (medical, surgical, obstetric, and ophthalmic), the two former receive a salary of £250 and the latter £50. Three assistants in the clinical laboratory are paid, one at the rate of £400, and two at £250 each, per annum. There is also an assistant in the laboratory for chemical pathology, paid at a salary of £200. Appointments open to students before qualification: Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third year's work. Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity ward, thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anæsthetics by one of the hospital anæsthetists. The Students' Club comprises a spacious restaurant and smoking and reading room. There is no occasion for students to leave the hospital buildings during working hours. The curriculum is arranged to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of London and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Fees.—The annual fees are: for first year (preliminary subjects) £25, and for each subsequent year £50. These fees cover all tutorial classes, but do not include instruction in infectious fevers, pharmacy, and vaccination. Qualified practitioners are permitted to attend the hospital practice on terms which may be ascertained from the medical secretary.

Scholarships and Prizes.—At this school there are five Entrance Scholarships—namely, two in Arts, equivalent to the tuition fees for the first medical examination; two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in Anatomy, Physiology, and Chemistry. The value of all entrance scholarships must be taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (*a*) William Tite Scholarship for second-year students, £25; (*b*) and (*c*) Musgrove Scholarship or (alternately) Peacock Scholarship, each for third-year students and tenable for two years, £35 each; (*d*) Cheselden Medal, Surgery and Anatomy; (*e*) Mead Medal, Medicine, Pathology, and Hygiene; (*f*) Toller Prize, Medicine, Pathology, and Hygiene; (*g*) Bristowe Medal, Pathology and Morbid Anatomy: (*h*) Solly Medal and Prize, biennially, Surgical Reports; (*i*) Treasurer's Gold Medal for the most distinguished fifth-year student; (*j*) Wainwright Prize, Medicine, Pathology, and Hygiene; (*k*) Hadden Prize, Pathology; (*l*) Beaney Scholarship, £50 biennially, Surgery and Surgical Pathology; (*m*) Sutton Sams Prize, biennially, reports of cases in Obstetric Medicine; (*n*) Grainger Testimonial Prize, £31 10*s.* Anatomy and Physiology; (*o*) Louis Jenner Research Scholarship, tenable for two years, £60 annually, Pathology; and (*p*) Research Scholarship, tenable for two years, £200 per annum.

The Dean of the Medical School is Sir Cuthbert S. Wallace, the Sub-Dean Dr. C. R. Box, and the Medical Secretary Dr. A. Elliot, from whom any further information may be obtained.

UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.—University College has been constituted a University centre for the teaching of medical sciences. The College Faculty of Medical Sciences comprises the Departments of Physics, Chemistry, Botany, and Zoology (the Preliminary Medical Sciences); also the Departments of Anatomy, Physiology, and Pharmacology (the Intermediate Medical Sciences), and the Department of Hygiene and Public Health (Post-graduate Study).

Faculty of Medical Sciences.—Composition fees.—For the courses required by the University of London. 1. For the First Medical Course, 35 guineas, entitling to one attendance and to the privileges of the Union Society for one session. 2. For the Second Medical (Intermediate) Course 80 guineas, payable in two instalments of 40 guineas each. This fee entitles to attendance at Anatomy and Physiology during three years and to one attendance at Organic and Applied Chemistry, Pharmacology, and Materia Medica, and to the privileges of the Union Society for two sessions.

For the medical education required by the Examining Board in England and the Society of Apothecaries. First examination, Parts I., II., III., 29 guineas, entitling to attendance for the First and Second Terms and to the privileges of the Union Society for one session; 35 guineas, entitling to attendance throughout the session and to the privileges of the Union Society for one session. First Examination, Part IV., and second examination, 80 guineas, payable in two instalments of 40 guineas each. This fee entitles to attendance during three years in all subjects

but Practical Pharmacy and to the privileges of the Union Society for two sessions.

Scholarships and Prizes.—The first three items on the present list require a complete intermediate course at University College. The money value and subjects at examinations are as follows: (*a*) The Bucknill Scholarship, 135 guineas; (*b*) and (*c*) two Entrance Exhibitions, 55 guineas each, Chemistry, Physics, Botany, and Zoology; (*d*) Cluff Memorial Prize, £15 biennially, Anatomy, Physiology, and Chemistry; (*e*) Schäfer Prize in Physiology, £18 triennially; (*f*) Sharpey Physiological Scholarship, £105, Biological Sciences; (*g*) Morris Bursary for sons of deceased professional men, by nomination, tenable for two years, £16 a year; and (*h*) five Gold and five Silver Medals awarded annually in various departments.

Women students are admitted.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—Dean: Dr. G. F. Blacker. Vice-Dean: Dr. A. M. H. Gray. Secretary: G. E. Adams. Open to men and women students. Fees for Preliminary and Intermediate Course: See under University College. For the Final M.B., B.S. (London) Course, 112 guineas if paid in one sum, 115 guineas if paid in two instalments, as follows—first year, 70 guineas; second year, 45 guineas. This fee entitles to attendance on Lectures and Hospital Practice during three years and to one attendance on Practical Pathology and Practical Surgery. Vaccination and attendance at a Fever Hospital are not included. This course of instruction is also suitable for the corresponding examinations at the Universities of Oxford, Cambridge, and Durham, and for the medical education required by the Examining Board in England and the Society of Apothecaries.

There are over 300 beds in the hospital.

Medical and Surgical Unit.—Whole-time Directors of medical and surgical units have recently been appointed. They are responsible for the systematic teaching of the principles of medicine and surgery and are assisted by whole-time assistants. The teaching of practical medicine and surgery and of their special branches continues to be conducted by the honorary staff of the hospital.

The school has recently been the recipient of a large donation from the Rockefeller Foundation, which will enable it largely to increase its facilities for clinical and pathological study and also to establish an obstetrical unit on similar lines to those of medicine and surgery.

Special Departments, Clinical and Laboratory Facilities.—Those who are desirous of carrying out original research in Pathology, including Morbid Anatomy, Bacteriology, Experimental Pathology, and Chemical Pathology, are admitted to work in the laboratories of the school by the Professor of Pathology, and under certain conditions can receive grants from the Charles Graham Medical Research Fund. A special course of instruction is given in conjunction with University College for preparation for the examinations for Diplomas in Public Health of the various universities and examining bodies. In the Dental School in Great Portland-street, formerly known as the National Dental Hospital, there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

Appointments tenable by Students.—Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Eight house physicians and house surgeons, four senior and four junior obstetric assistants, are selected annually by examination from among the senior students who have a medical qualification. The house physicians and house surgeons reside free in the hospital for six months, and the senior obstetric assistants for three months. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: 1. The Resident Medical Officer. This officer is appointed for a period of two years and is chosen from amongst the more senior recent residents of the hospital. 2. The two Surgical Registrars are also chosen from among the more senior recent residents of the hospital. 3. The Obstetric Registrar. 4. Two Casualty Medical Officers and a Casualty Surgical Officer are appointed, each for a period of six months. 5. Assistant in Ear and Throat Department, appointed for one year. 6. Assistant in Ophthalmic Department, appointed for one year. 7. Registrar in Anæsthetic Department, appointed for one year. 8. Deputy Anæsthetists. During the absence of one or another of the Anæsthetists in the summer months a senior qualified student is appointed as a substitute and is granted a special certificate.

Museum of Pathological Anatomy.—The Museum is open for study from 9 A.M. to 5 P.M. Microscopic sections of most of the specimens in the Museum have been prepared and are available for the use of students on application to the Curator. The Museum contains 1100 admirable paintings by Sir Robert Carswell and Sir Charles Bell and a collection of old surgical instruments formerly belonging to Robert Liston.

The Anatomical Museum of the University of London, University College, is open to all students of University College Hospital and Medical School on the recommendation of the School Committee.

The Medical Library is open daily for the purposes of study to every student of the Medical School from 9 A.M. to 5 P.M., Saturdays 9 A.M. to 1 P.M. It contains about 13,500 works on medical subjects, including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of Medical and Surgical Science, and (2) of promoting social intercourse among its members. All Students of the Medical School are eligible for membership. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet court in the Medical School. The Athletic Ground, which is used in conjunction with the Union Society of the University of London University College, is situated near the Great Western Railway station at Perivale.

Scholarships and Prizes.—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(*a*) Entrance Scholarship, Bucknill, 167 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Exhibitions, 112 guineas each, Anatomy and Physiology; (*e*) Graham Scholarship in Pathology, £400 per annum for two years, awarded by the Senate of the University of London; (*f*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*g*) Atchison Scholarship, tenable for two years, £55 per annum; General Proficiency in Medical Studies: (*h*) Magrath Clinical Scholarship, about £100, Clinical Cases; (*i*) Percival Alleyn Scholarship, about £60, Surgery; (*j*) Filliter Exhibition, £30, Pathology; (*k*) Erichsen Prize, £10 10*s.*, Practical Surgery; (*l*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*m*) two Liston Gold Medals for Clinical Surgery; (*n*) Alexander Bruce Gold Medal for Pathology and Surgery; and (*o*) Tuke Silver and Bronze Medals for Pathology. (*p*) Radcliffe Crocker Travelling Scholarship for Dermatology. (*q*) Leslie Pearce Gould Travelling Scholarship for Surgery.

Residence of Students.—University College Hall, Ealing, is recognised by the Medical School authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge. Gentlemen who desire assistance in their studies should consult the Dean or Lecturers.

WESTMINSTER HOSPITAL.—The hospital contains 215 beds and affords relief to upwards of 2000 in-patients and 15,000 out-patients annually. There are separate departments for Diseases of the Eye, Ear, Skin, Teeth, and Throat, for Orthopædic practice, for Diseases of Women, for Diseases of Children, for Radiography, and for the Light Treatment. The Anatomical, Pathological, and Materia Medica Museums are open to all students of the school.

The usual registrarships and house appointments are open to male and female students.

By a scheme for the concentration of the teaching of the preliminary and intermediate subjects of the curriculum, which has the support of the London University, an arrangement has been made by the Westminster School for the teaching of these subjects at King's College. Students, however, may join the Westminster Medical School as formerly and may compete for Entrance Scholarships as heretofore.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: (*a*) Arts Scholarship, the "Guthrie," £60. (*b*) Science Scholarships: Natural Science Scholarship, £60; Chemistry and Physics Scholarship, £30; and Two Scholarships in Anatomy and Physiology, £50 each. Summer Session: Two Scholarships in Anatomy and Physiology, £50 each. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Notes of Cases; Clinical Surgery Prize, £5, Notes of Cases; Chadwick Prize £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology, 5 guineas, a Paper and Tests in Practical Work; Alfred Hughes Memorial Prize, open to Second-year Students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students—Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second-year Scholarship, £20, Elementary Anatomy, Physiology, Histology, and Organic Chemistry; Daniell Scholarship, tenable for two years, £20, Chemistry; Rabbeth Scholarship, open to First-year Students, £20, Class Examinations in the Preliminary Scientific Course; and the Sambrooke King's College Scholarship in Science, value £25.

The Dean is Dr. A. S. Woodwark, to whom inquiries may be addressed.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN, 8, Hunter-street, Brunswick-square, W.C.—The fee for the medical course for the degrees of the University of London and for the diplomas of the Royal Colleges of England and for other qualifications is £240 in five instalments. This sum includes library and laboratory fees.

The Royal Free Hospital contains 237 beds. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital for Paralysed and Epileptic, and Brompton Chest Hospital.

An agreement has been made under which students of the school attend full clinical courses at St. Mary's Hospital, Paddington (305 beds).

Special courses are arranged for the Primary Fellowship Examination of the College of Surgeons; also for dental students in conjunction with the London Dental Hospital, Leicester-square, and the National Dental Hospital.

Students after qualification can hold the posts of house physician, house surgeon, obstetric assistants, clinical assistants, assistant anæsthetist, medical, gynæcological, and surgical registrars, assistant pathologist, and museum curator; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics. Many other resident posts in London and elsewhere are also open to them.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments.

There are residential chambers at 8, Hunter-street, 25, Gordon-square, 16, Brunswick-square, and 36, Tavistock-square, and the Warden can be consulted on the subject of other residences for students. The Students' Union arranges the social, athletic, and other clubs and societies.

Scholarships and Prizes.—(*a*) Isabel Thorne Scholarship, £30. (*b*) St Dunstan's Medical Exhibition, £60 a year, tenable for three or five years. (*c*) Mrs. George M. Smith Scholarship, £50 a year, tenable for three or five years and next to be awarded in 1921. (*d*) Bostock Scholarship, tenable for two or four years, and next to be awarded in June, 1923, £60. (*e*) Mabel Sharman-Crawford Scholarship, tenable for four years, £20 a year. (*f*) Sir Owen Roberts Scholarship, £75 a year for four years. (*g*) Mabel Webb Research Scholarship, tenable for one year and renewable, £30, Physiology, Chemistry, or Pathology. (*h*) Fanny Butler Scholarship, tenable for four years; next award in July, 1922, £14 10*s*. (*i*) John Byron Bursary, tenable from two to four years, for students already in the School requiring assistance for the prosecution of their medical studies, application to the Secretary by March 31st; next award in March, 1921, £20. (*k*) Ellen Walker Bursary tenable for two years, awarded to a student beginning fourth year of medical study, £25 a year. (*l*) Helen Prideaux Scholarship, awarded every second year to a student who has become qualified during the two years immediately preceding the award, and to be spent in assisting the holder to further study, £40. (*m*) Agnes Guthrie Bursary, value £50, is offered annually to students who desire to pursue a full course of study for the Licentiateship in Dental Surgery. (*n*) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, awarded annually in June. It is open to all medical women, preferably coming from India, or going to work in India, for assistance in Post-graduate study. (*o*) Sarah Holborn Scholarship, value £20 a year for three or five years, awarded every alternate year; next award in 1921. (*p*) Dr. Margaret Todd Scholarship, tenable for four years, £37 10*s*. a year, awarded in alternate years; next award in July, 1921. (*q*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July, 1924. Two Richardson-Kuhlmann Prizes are given each year, value £12, for proficiency in Clinical Obstetrics, value £8, for proficiency in senior subjects respectively. Two Evans Prizes of £2 2*s*. and £1 1*s*. are given each year on the results of the class examination in Midwifery. The Evans Prize for Operative Midwifery, value £5 5*s*., is awarded yearly. The Edith Pechey Phipson Prize in Pharmacology, value £3 3*s*., is awarded annually. There is also a small loan fund from which assistance can occasionally be given to students and to graduates who specially require pecuniary help. Prizes and Certificates of Honour are awarded in each class at the end of the session.

The Dean of the Medical School is Miss Aldrich-Blake, M.D., M.S.; the Honorary Secretary, Dr. May Thorne; and the Warden and Secretary, Miss L. M. Brooks, to whom inquiries may be addressed.

UNIVERSITY OF DURHAM.

Two Diplomas, one Licence, and six degrees are conferred—viz., the Diploma in Public Health, Diploma in Psychiatry, the Licence in Dental Surgery, and the degrees of Bachelor of Medicine, Bachelor of Surgery, Master of Surgery, Doctor of Medicine, Bachelor of Hygiene, and Doctor of Hygiene.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Anatomy, Elementary Biology, Chemistry, and Physics. The subjects of the Second Examination are—Anatomy and Physiology. The subjects for the Third Examination are—Materia Medica and Pharmacy, Pharmacology, Medical Jurisprudence, Public Health, and Pathology and Elementary Bacteriology. The subjects of the Fourth Examination are—Medicine, Clinical Medicine and Psychological Medicine, Surgery and Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Therapeutics, and Diseases of the Skin, of the Throat, Nose, and Ear, and of Children.

It is required that at least one of the five years of professional education shall be spent in attendance at the University College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of Bachelor of Medicine and Surgery of the University of Durham and must have been engaged for at least two years subsequently to the date of acquirement of the degree of Bachelor of Surgery, in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical

or surgical practice. The candidate for the M.D. degree may present an essay or undergo an examination in the Principles and Practice of Medicine, &c. The subjects of examination for the M.S. are:—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham has instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates shall not be under 40 years of age and shall have been in active practice for 15 years as registered medical practitioners. They shall produce certificates of moral character from three registered members of the medical profession. The fee will be 50 guineas, of which 20 guineas will be retained if the candidate fails to satisfy the examiners.

Candidates for any of the above degrees, diplomas or licence, must give at least 28 days' notice to Professor Howden, Registrar, College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before the 1st of April.

Scholarships and Prizes.—In connexion with this University the following Scholarships and prizes are awarded:—(*a*), (*b*), (*c*), and (*d*). Four Scholarships of £25 a year each, tenable for four years; the examination will be the September Matriculation Examination. Candidates must take English, Latin, Arithmetic, Euclid, Algebra, Geography, English History, and one, or two, of the three languages—French, Greek, German. (See College Calendar for special books.) Open to candidates desirous of being admitted as Medical Students. The successful candidates must take out their entire curriculum at the University of Durham College of Medicine, Newcastle-upon-Tyne. (*e*) Pears Scholarship of £50 a year (when vacant), tenable for three years; Matriculation Examination.—At the College of Medicine are: (*f*) Dickinson Scholarship, interest on £400 and gold medal; examination in Medicine, Surgery, Midwifery, and Pathology. Open to full students of the College of Medicine who have passed the third M.B. Examination. (*g*) Tulloch Scholarship, interest on £400; examination in Elementary Anatomy, Biology, Chemistry, and Physics. (*h*) Charlton Memorial Scholarship, interest on £700; examination in Medicine. Open to full students of the College entered for the class on the Principles and Practice of Medicine. (*i*) Gibb Scholarship, interest on £500; awarded annually as a Scholarship in Pathology to full student who passes the best examination in that subject. No student is eligible after completion of his curriculum. (*j*) Luke Armstrong Memorial Scholarship, interest on £680: Original Essay in Comparative Pathology. Open to all Graduates in Medicine or Hygiene and candidates for these degrees who have spent six months at the University and whose age does not exceed 30 years. (*k*) Stephen Scott Scholarship, interest on £1000; Original Essay on any Surgical subject. Open to any graduate in Medicine or Surgery of the University or any student of the College of Medicine. Student's age must not exceed 30 years. (*l*) Heath Scholarship in Surgery, of the value of £200, awarded every second year. All Graduates in Medicine or Surgery of the University are eligible. (*m*) Philipson Scholarships (2). The interest on £1800 to the candidates who obtain the highest marks in the Final M.B. Examinations held in March and June respectively. (*n*) Gibson Prize, interest on £250 stock; examination in subject of Midwifery and Diseases of Women and Children. Open to students who have attended one course of lectures on Midwifery and Gynæcology. (*o*) Outterson-Wood Prize, interest on £250, in Psychological Medicine. (*p*) Turnbull Prize and Medal; examination in Surface Anatomy. Open to students at end of their second winter session.—At the Royal Infirmary is (*q*) Goyder Memorial Scholarship, interest on £325; awarded annually to student who most distinguishes himself in Clinical Medicine and Clinical Surgery at the Royal Infirmary. For further information apply to Professor R. Howden, Registrar of the College.

THE COLLEGE OF MEDICINE, Newcastle-upon-Tyne.—Clinical instruction is given at the Royal Victoria Infirmary, containing about 580 beds. In it adequate accommodation is provided for the study of the various special subjects, in addition to the ordinary clinical work. Post-graduate classes are held.

NEWCASTLE-UPON-TYNE ROYAL VICTORIA INFIRMARY.—The Infirmary was founded in 1751, but has been entirely rebuilt, the new hospital being opened by His late Majesty King Edward VII. in 1906. The number of beds is 550. The number of in-patients annually is 9500 and of out-patients 70,000. The medical students of the University of Durham attend the practice of this hospital. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are held by the Assistant Physicians, Assistant Surgeons, and Surgical Registrars weekly, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic, Throat, Nose, and Ear, Skin, Gynæcological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory, in which all clinical bacteriological investigations are carried out—opsonic indices estimated with a view to treatment by vaccines and serums, &c. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The surgical practice is especially good. The session opens on April 17th and Oct. 2nd of each year. Applications for detailed information should be made to the Dean, Dr. Horsley Drummond, at the hospital.

There are other institutions in addition to the Royal Victoria Infirmary at which the student of medicine of the University of Durham can receive clinical instruction. Practical Midwifery can be studied at the Newcastle Lying-in Hospital. Instruction is given in Psychological Medicine at the Sunderland Mental Hospital, Ryhope. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health. Ophthalmology is further taught at the Northumberland, Durham, and Newcastle Infirmary for Diseases of the Eye. Secretary: Mr. Richard Smith, 61, Westgate-road, Newcastle-on-Tyne.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees extends over five years from the date of commencement of professional study. As a rule the first four of these years must be spent in the University, but the Senate has power of recognising attendance at another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Chemistry, Physics, and Elementary Biology. In the case of such students at least three years must be spent in attendance upon classes at the University. The fifth year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary to the Board, Joint Matriculation Board, 315, Oxford-road, Manchester. First Examination.—Chemistry and Physics and Elementary Biology. Second Examination.—Anatomy and Physiology. Third Examination.—General Pathology and Bacteriology, Materia Medica, and Practical Pharmacy. Fourth Examination (at the end of the fourth year).—Forensic Medicine, Toxicology, Public Health, Therapeutics, and Special Pathology. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery, Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital one month, and lunatic asylum three months. Vaccination instruction must be taken out and courses of Ophthalmology, Medical and Surgical Anatomy, and Operative Surgery.

Degrees of Doctor of Medicine and Master of Surgery.—At the end of one year from the date of having passed the final M.B., Ch.B. examination the candidate will be eligible to present himself for the higher degrees of either Doctor of Medicine or Master of Surgery or both. Candidates have to present a thesis on some subject embraced in the medical curriculum, and pass a general examination in Principles and Practice of Medicine for the M.D., and one in Principles and Practice of Surgery, including operations on the cadaver for the M.Ch. A thesis of exceptional merit may exempt from any part of these examinations.

Degree of Ph.D.—The Degree of Doctor of Philosophy is conferred upon candidates who possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and who have been engaged, to the satisfaction of the Medical Faculty, in advanced study and research for a period of not less than two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. After the first year of the course candidates may carry on research elsewhere, under approved conditions, and on completing the course present an original thesis on the subject and submit themselves for oral and possibly written examination.

Fees.—Matriculation, £2; First Examination, £2; Second Examination, £2; Third Examination, £2; Fourth Examination, £2; Final Examination, £8; M.D. or Ch.M., £10.

At the University of Birmingham the following Scholarships are awarded:—(*a*) Myers Travelling Studentship of £150, tenable for one year, awarded by vote of committee to M.B., Ch.B. Birm., B.Sc. candidates, tenable at some University or Hospital not in Great Britain or Ireland; (*b*) Ingleby Scholarship of £10, awarded to the candidate at Final Examination obtaining highest "first-class" marks in the subjects of Midwifery and Diseases of Women; (*c*) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (*d*) Sands Cox Scholarship of £42, tenable for three years, awarded to the candidate, not being more than 19 years of age, taking the highest marks at the July Matriculation; (*e*) Dental Scholarship of £37 10*s.*, Open Competitive Examination in subjects learned during apprenticeship; (*f*), (*g*), (*h*), and (*i*) Four Queen's Scholarships of £10 10*s.* each. In the Second and Fourth Examinations the Scholarship is awarded respectively to the student taking the first place and obtaining "first-class" marks. In the Third Examination the Scholarship is awarded to the student obtaining the highest "first-class" marks in Pathology and Bacteriology, provided that such student passes at the same examination in the subjects of Materia Medica and Practical Pharmacy. In the Final Examination the Scholarship is awarded to the candidate taking the first place in the examination—that is, obtaining the greatest aggregate number of marks—provided that in each of the subjects of Medicine, Surgery, and Midwifery he gains not less than 60 per cent. of the total available marks; (*j*) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (*k*) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases.

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital and the Queen's Hospital, under the direction of the University Clinical Board. The hospitals possess more than 500 beds, treating annually over 8000 in-patients and 100,000 out-patients. The curriculum is adapted in the first place to the University of Birmingham, but it also meets the requirements of the examinations of other licensing bodies. At the General Hospital there are open to the students the following appointments: A surgical registrar, £200 per annum; a resident medical officer, elected annually (£155); a resident surgical officer, elected annually and eligible for re-election for three years (£180); a resident pathologist, elected for six months (£100); three house physicians and four house surgeons hold office for six months, receiving board, residence, and salaries at the rate of £100 a year; two house surgeons to the gynæcological, ophthalmic, and aural departments are elected every six months, receiving board, residence, and a salary of £100 a year; two assistant house surgeons are elected every three months, receiving board, residence, and salaries at the rate of £40 a year; a resident medical officer at the Jaffray Hospital, who is elected annually but is eligible for re-election, and who receives £150 a year; and a resident medical assistant at this hospital, who is not necessarily qualified, is provided with board and residence, and holds office for three months. At the Queen's Hospital there are open to the student the following appointments: Three house physicians, three house surgeons, and one obstetric and ophthalmic house surgeon, who hold office for six months and have salaries at the rate of £90 a year. Thirty-eight other appointments of varying value are at the City Workhouse and Workhouse Infirmary, at the Birmingham General and Branch Dispensaries, at the Birmingham Lunatic Asylums, at the City Fever Hospitals, at the Children's Hospital, at the Birmingham and Midland Eye Hospital, at the Orthopædic and Spinal Hospital, at the Maternity Hospital, and at the Ear and Throat Hospital.

Post-graduate Courses.—A "Lectureship in Psychotherapy" has recently been established in the University.

A course of lectures on Venereal Diseases was held during the last Winter Session for practitioners and students, and courses of Clinical Instruction in Physiology, Medicine, Children's Diseases, Radiology, and Electrical Treatment are given.

BIRMINGHAM GENERAL HOSPITAL.—374 beds are in daily use, 6440 in-patients per annum. Special wards for children, gynæcological, septic and infectious cases; special beds for eye, ear, and skin cases. About 50,000 out-patients per annum. Laboratories for bacteriology and morbid histology. Separate rooms adjoin the medical and surgical wards for clinical pathology. Five operating theatres (one for out-patients), all designed and fitted on the most modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments. The Jaffray Branch Hospital contains 56 beds.

QUEEN'S HOSPITAL (Beds 223).—Similar arrangements for clinical teaching are made here, and the material also is excellent. Ward and tutorial classes and post-graduate courses are regularly conducted by the staff, there are daily clinics in the out-patient department, while teaching duties are definitely assigned to the house physicians and house surgeons. There are also special departments for gynæcology and ophthalmology, radiography, bacteriology, massage, electricity, whirlpool baths, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, Birmingham.—This hospital possesses 120 beds, and there is an average daily attendance of out-patients of 250. Students attending for a period of three months will be granted certificates which will qualify for the University and Conjoint Board examinations. Post-graduate courses are available on various subjects when a sufficient number of graduates are present. A limited number of Non-Resident Clinical Assistants posts are available to qualified practitioners, particulars of which can be had on application to the General Superintendent.

UNIVERSITY OF LIVERPOOL.

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), and Master of Hygiene (M.H.).

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 21 years on the day of graduation. At least two of the five years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The fee is £5 for each examination. The subjects of the First Examination are: (1) Chemistry, Inorganic, Organic, and Physical; (2) Biology (Zoology and Botany); and (3) Physics. The examination is divided into two parts—namely, (1) Chemistry and Physics,

and (2) Biology; and candidates may present themselves in these parts separately. The subjects of the Second Examination are (*a*) Anatomy and Physiology (including Physiological Chemistry and Histology), and (*b*) Materia Medica and Pharmacy and Pharmacology. Candidates may present themselves in (*a*) or (*b*) separately. The subjects for the Final Examination are: (1) General Pathology, Morbid Anatomy, and Bacteriology; (2) Forensic Medicine, Toxicology, and Public Health; (3) Obstetrics and Diseases of Women; (4) Surgery, Systematic, Clinical, Operative, and Practical, including Ophthalmology; (5) Medicine, Systematic and Clinical, including Mental Diseases and Diseases of Children, and Therapeutics. The Final Examination is divided into three parts, the first consisting of subject (1), the second of subject (2), the third of subjects (3), (4), and (5). Candidates may present themselves in these parts separately. Candidates for the third part must have completed the fifth year of medical study.

Degrees of Doctor of Medicine and Master of Surgery.—No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least one year has elapsed since he passed the examinations for those degrees, or, in the case of the degree of Doctor, unless, having obtained substantially equivalent degrees in an approved University, he has subsequently spent two years in the University or in the Clinical School in the performance of research or the conduct of systematic clinical observations. Candidates for the degree of Doctor of Medicine are required to present a dissertation embodying the results of personal observations or original research, either in some department of medicine or of some science directly relative to medicine: provided always that original work published in scientific journals or separately shall be admissible in lieu of, or in addition to, a dissertation specially written for the degree.

The University has recently established a Diploma in Medical Radiology and Electrology—Part I., Physics; Part II., Radiology and Electrology. The parts may be taken at one examination or separately. Fees for tuition have been increased by 33⅓ per cent.

At this University the following Scholarships and Fellowships and Prizes are awarded:—(*a*) and (*b*) Robert Gee Entrance Scholarships, two annually, of £25 each, tenable for two years, Joint Matriculation Board Examination held in July, open to First M.B. Course Students; (*c*) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects, Perpetual Course at the University; (*d*) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination among Senior Students in Anatomy, Physiology, Pharmacology, and Materia Medica; (*e*) Derby Exhibition of £15, Competitive Examination among Fourth- or Fifth-year Students in Clinical Subjects, and Clinical School Exhibition of £15 annually for Fourth- or Fifth-year students; (*f*) University Scholarship of £25 for one year, awarded on results of Second Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £100 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Bio-Chemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £150, for one year; (*m*) Ethel Boyce Fellowship in Gynæcological Pathology, of £100, for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (*o*) Rankin Exhibition in Practical Anatomy, of £25, for one year; numerous prizes and medals.

Medical School Buildings.—Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation. All the laboratories and class-rooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Bio-Chemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. A new building for Tropical Medicine has recently been opened.

Clinical Instruction.—The Clinical School of the University now consists of four general hospitals—the ROYAL INFIRMARY, the DAVID LEWIS NORTHERN HOSPITAL, the ROYAL SOUTHERN HOSPITAL, and the STANLEY HOSPITAL; and of five special hospitals—the Eye and Ear Infirmary, the Hospital for Women, the Infirmary for Children, St. Paul's Eye Hospital, and St. George's Hospital for Skin Diseases. These hospitals contain in all a total of about 1134 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

THE VICTORIA UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the University—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine is awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation and that they have pursued the courses of study required by the University Regulations during a period of not less than five years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University and one year at least having been passed in the University subsequently to the date of passing the first M.B. Examination. All candidates for the degrees of Bachelor of Medicine and Bachelor of Surgery are required to satisfy the examiners in the several subjects of the following examinations. (These are now under revision.)

The First Examination.—(1) Inorganic Chemistry and Physics; (2) Biology; and (3) Elementary Organic Chemistry and Bio-Chemistry. Candidates must have attended during at least one year courses both of lectures and of laboratory work in each of the above-named subjects. The Examination is divided into three parts: Part 1, Inorganic Chemistry and Physics; Part 2, Biology; Part 3, Elementary Organic Chemistry and Bio-Chemistry; and the candidates may pass in these parts separately under certain conditions.

The Second Examination.—(1) Anatomy and Histology; (2) Physiology, including Physiological Chemistry. Candidates may pass in (1) and (2) separately under certain conditions.

The Third Examination.—(1) Pathology; (2) Pharmacology and Therapeutics. These subjects may be taken separately under certain conditions.

The Final Examination.—(1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynæcology (including Clinical and Practical); (4) Forensic Medicine (including an Oral Examination); (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts.

Candidates for the Second Part of the Final Examination must have completed the fifth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The disserta-

tion must embody the results of personal observation or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. The subjects of examination are as follows: (1) Surgical Anatomy; (2) Surgery; (3) Operative Surgery; (4) Clinical Surgery; (5) Ophthalmology; and (6) Pathology and Bacteriology.

Scholarships, Fellowships, and Prizes.—At this University there are 22 Foundation Scholarships, 12 Exhibitions, five being for subjects connected with medical study, a Surgical Prize, a University Fellowship (Leech Fellowship, £100), Research Fellowships in Public Health, and Honorary Research Fellowships. 13 Entrance Scholarships are tenable for Medical courses; one Scholarship is offered in Surgery, Biology, Physiology, and Diseases of Children respectively, and one General Medical and Surgical. Exhibitions are offered in Physiology and Anatomy, and one for French and German. "The Dumville" Surgical Prize is awarded on the results of the Final Examination in Surgery in the Summer Term, £15. The Leech Fellowship (£100) is for the encouragement of study and research, and is open to persons who have graduated M.B., Ch.B., in the University not more than 18 months previously. The Honorary Research Fellowships, tenable for two years, conferring the right of free use of the laboratories, are awarded generally in October on application, with evidence of capacity for independent investigation.

There are many entrance scholarships, the examinations for which are held in the month of May. Full particulars can be obtained from the Dean.

The Medical School.—This medical school, largely extended in 1895, is provided with dissecting-rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, a museum, and a library. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped for cancer research and investigation in general pathology. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica. In the public health department, which is lodged in a separate institute in York Place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, a lunatic asylum, and a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, which together with the associated hospitals at Cheadle contains 1109 beds, exclusive of those reserved for military cases, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Clinical Instruction.—THE MANCHESTER ROYAL INFIRMARY.—The Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 628 patients. The medical side consists of five units, each unit having a testing room for the scientific investigation of morbid products and a class-room. The surgical beds are also arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing, and apparatus rooms, and its own class-room attached. All of these units are occupied. The fine educational block provides very handsomely for the wants and comforts of the students, there being separate suites of rooms for the men and the women, and also a large common reading room, a lecture theatre, and a museum. The present annual average number of in-patients is 13,650, of out-patients 27,000, and the list of casualties in the accident room has averaged 17,000 per annum. About 9000 operations are performed annually in the operation theatres. Associated with the infirmary are: (1) the Convalescent Hospital at Cheadle, containing 136 beds; (2) the Royal Lunatic Hospital at Cheadle, accommodating with its branches 430 patients; and (3) the Central Branch in the city for casualty and out-patient work, and 50 beds for pensioners. The Associated Hospitals thus contain 1244 beds and are under the same management. Women students are admitted on the same terms as men.

Fees.—Medical Practice: Three months, 7½ guineas; six months, 12 guineas; 12 months, 18 guineas; full period required by the Examining Boards, 60 guineas.

Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College Syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

The Dean of Clinical Instruction is Dr. E. M. Brockbank.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, Gartside-street, Manchester, and St. Anne's-on-the-Sea.—The hospital contains 190 beds and 28 in the Convalescent Home, St. Anne's-on-the-Sea. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. Out-patients are seen daily at 9 A.M. at the new Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

THE MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Park-place, Cheetham Hill-road, Manchester.—The hospital contains 70 beds. Out-patients are seen daily from 8.30 to 10 A.M.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination.

The First Examination.—The First Examination consists of: Part I., Physics and Chemistry; Part II., Biology. Candidates will be allowed to pass the two parts separately.

The Second Examination.—The Second Examination consists of: Part I., Anatomy and Physiology; Part II., Materia Medica and Pharmacy. Candidates will be allowed to pass the two parts separately.

The Final Examination.—The Final Examination consists of: Part I., Pathology and Bacteriology. Part II., Forensic Medicine and Public Health. Part III., Medicine: Systematic and Clinical, including Mental Diseases and Diseases of Children; Surgery—Systematic, Clinical, and Practical; Obstetrics, and Gynæcology—Systematic, Clinical, and Practical; Pharmacology and Therapeutics. Candidates will be allowed to pass Parts II. and III. separately or together, and they may present themselves for examination in Part I. at the end of the tenth term.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least one year has elapsed since they passed the examination for those

degrees. Candidates for the degree of Doctor of Medicine are required to present a dissertation and, if the dissertation be accepted, may be required to pass an examination.

The first term commences on Oct. 1st. Prospectus, &c., can be obtained from the Dean of the Medical School.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods may do so on terms which may be obtained from the Clinical Sub-Dean.

Clinical Instruction.—THE LEEDS GENERAL INFIRMARY, in connexion with this medical faculty, has accommodation for 620 in-patients, including 88 beds at branch hospitals in the country. During the last year 9495 in-patients and 37,746 new out-patients were treated. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electro-therapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. A Gynæcological and Extern Obstetric Department, together with Laryngeal and Skin Clinics, are in operation. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 21 years on the day of graduation and pursue the courses of study required by the University regulations during a period of not less than five years subsequently to the date of his matriculation, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

The First Examination.—The subjects of the examination are Chemistry, Physics, and Biology. The Intermediate B Sc. Examination in these subjects will, on payment of the required additional fee, be accepted instead of this examination. Candidates must, after matriculation and registration as medical students, have attended courses of instruction (lectures and laboratory work) in chemistry, physics, and biology for one year each.

The Second Examination.—The subjects of the examination are Anatomy and Physiology.

The Third Examination.—The subjects of the examination are Pathology and Pharmacology. A candidate entering for the first, second, or third examination, who shall pass creditably in one subject of either examination and obtain a certain minimum of marks in the other, may enter for such other subject separately in a subsequent examination. Candidates must have completed the fourth year of professional study.

The Final Examination.—The subjects of the examination are Medicine (including Forensic Medicine, Public Health, Mental Diseases, and Diseases of Children); Surgery; and Obstetrics (including Gynæcology). Candidates must satisfy the examiners in all subjects at the same examination. Candidates must have completed the fifth year of professional study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least one year previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B., Ch.B. at least one year previously, and must since have held for not less than six months a surgical appointment in a public hospital. The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy, Surgical Pathology, and Bacteriology.

Scholarships, &c.—At this University, in addition to four Edgar Allen scholarships of £100 a year for three years, holders of which can take the courses in the Faculty of Medicine, there are 8 scholarships and a Town Trust Fellowship. Full particulars as to curriculum, scholarships, &c., may be had on application to the Registrar or to the Dean of the Medical Faculty.

The Medical School.—The new buildings of the University opened in 1905 are situated at the west end of the city, adjoining Weston Park, and the Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of a Students' Representative Council, elected annually. There are large and comfortable common rooms both for men and women students. A refectory is open daily at the University where students may obtain refreshments, lunch, dinner, &c., at extremely moderate prices. The University journal, *Floreamus*, edited by a committee of staff and students, is published each term. The University Hostel, "Oakholme," Clarkehouse-road, is recognised by the Senate as a residence for women students, full particulars of which may be obtained of the tutor for women students.

Clinical Instruction.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes. These are as follows: The ROYAL INFIRMARY (Secretary, Mr. J. W. Barnes), containing 326 beds, with an annual average number of over 3800 in-patients, over 11,500 out-patients, and over 23,000 casualties; the Royal Hospital (Hon. Sec., *pro tem.*, to the medical and surgical staff, Mr. Vincent Townrow), with 191 beds, and an annual number of 3000 in-patients, over 20,000 out-patients, and nearly 20,000 casualties; and the Jessop Hospital for Diseases of Women, with 80 beds, about 900 in-patients, and about 3057 out-patients; also a Maternity department, with about 450 in-patients per annum and about 700 out-patient cases attended. Special courses on Fevers are held at the City Fever Hospitals (600 beds) and on Mental Diseases at the South Yorkshire Asylum (1610 beds). For purposes of clinical practice the practices of the Royal Infirmary and Royal Hospital are amalgamated, giving a total of 511 beds for the treatment of medical, surgical, and special cases. There are special departments for the treatment of Diseases of the Eye at each institution, with wards assigned to them. In addition to these the Royal Infirmary has special departments for the treatment of Diseases of the Skin and Ear, with beds assigned to them, whilst at the Royal Hospital there are special out-patient departments for Diseases of the Throat, Ear, Skin, Orthopædics, and Mental Diseases. Instruction is also given at the South Yorkshire Asylum (1694 beds). During the last year over 6000 patients passed through the wards of the two institutions, while those attending as out-patients numbered over 45,000. The department of Pathology and Bacteriology in the University is fitted with every requirement for the most advanced work in these subjects.

Fees.—The Composition Fee is £30 a year for each of the five years.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women alike. The winter session commences on Oct. 1st, 1920.

Conjoined Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five and a half years, of which three shall have been passed in the University, and two of these three subsequent to pass in the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations.

The First Examination.—The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses

pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.)

The Second Examination.—The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). Parts I. and II. may be passed separately or together.

The Final Examination.—The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine, Toxicology, and Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). Candidates may pass I. and II. together, or separately, and Forensic Medicine and Toxicology may, at the option of the candidate, be taken either with Part I. or Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—Candidates shall be Bachelors of not less than two years as such, during which period they shall have attended the Surgical Practice of an institution approved for the purpose. They shall pass an examination in Surgical Anatomy, Pathology, and Bacteriology, and Operative, Clinical, and General Surgery, and present to the University a Dissertation on some subject of Surgery.

Clinical Instruction.—The allied hospitals (BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL) have between them about 600 beds and extensive out-patient departments, special clinics for Diseases of Women and Children and those of the Eye, Throat, and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well-equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High Frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 140 beds, and that of the Bristol Eye Hospital, with 40 beds. The total number of beds available for clinical instruction is therefore about 750.

Daily Post-Graduate Study.—For those who are able to devote several hours each day to hospital practice the University offers special facilities for Post-graduate work. Qualified medical practitioners may be appointed as Clinical Assistants for a period of one or more months. They may act as Assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Fee, £3 3*s.* per month.

Post-Graduate Clinical Work.—Demonstration courses with weekly lectures are held during May, June, and July. Fee, £2 2*s.* All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment at the Pathological Department

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

This University has the privilege of granting degrees in Medicine and Diplomas in Public Health. At the three constituent Colleges of Aberystwyth, Bangor, and Cardiff there are Professors of Chemistry, Botany, Zoology, and Physics, so that the students of the University can obtain proper instruction in the ancillary subjects. The foundation of a Medical Faculty has been laid at University College, Cardiff, where there is a recognised school of medicine.

University College, Cardiff: School of Medicine.—All classes are open to both men and women students. The courses of instruction given in the School of Medicine at the University College, Cardiff, are recognised as qualifying for the examinations of the Universities, Royal Colleges, and other licensing bodies in Great Britain and Ireland, and they are specially adapted to meet the needs of those University students studying for Welsh and London degrees. Having spent two or three years in study at Cardiff, and having passed the corresponding examinations, a student may proceed to London or elsewhere and complete his qualifying course for a University degree or for a diploma. It will be possible when the Welsh National School of Medicine is fully constituted for students to pursue the complete curriculum at Cardiff. Students who are preparing for these examinations may compound for their courses by paying a fee of £63, while a composition fee of £41 10*s.* includes all the necessary courses for the first and second examinations for the Diploma of the Conjoint Board. In all cases the composition fees may be paid by instalments. Hospital instruction is given at the King Edward VII.'s Hospital, Cardiff. The attention of students about to matriculate is drawn to the numerous entrance scholarships offered for competition at University College, Cardiff, in April next, most of which may be held by medical students. Full particulars of the examination for these may be obtained by application to the Registrar. In the department of Public Health established in 1899 instruction is given qualifying for the D.P.H. examinations. A course for the training of Health Visitors has been instituted. Further information may be obtained from the Dean of the Faculty of Medicine.

Clinical Instruction.—KING EDWARD VII.'S HOSPITAL, CARDIFF.—Students can attend the practice of this Hospital, which contains 450 beds. Founded 1837.—SWANSEA GENERAL AND EYE HOSPITAL.—Hospital, 256 beds, 186 civilian, 70 (sailor and soldier pensioners), Convalescent Home, 27 beds. In-patients, 3322; out-patients, 10,144. The accommodation is about to be increased by 50 beds. There is a full-time paid Pathologist and paid Assistant Pathologist, with a completely fitted Laboratory, and also a Venereal Diseases Department.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

Professional Examinations.—There are three Examinations, called herein the First Examination, the Second Examination, and the Third or Final Examination, each being partly written, partly oral, and partly practical. These examinations will be held in the months of January, April, July, and September or October

unless otherwise appointed. Every candidate must give notice in writing to Mr. F. G. Hallett, O.B.E., Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, W.C., 14 clear days before the day of the examination, transmitting at the same time the required certificates.

The subjects of the *First Examination* are—Chemistry, Physics, and Elementary Biology. A candidate may take this examination in two parts at different times (Chemistry and Physics must be taken together until the required standard is reached in both or in one of these subjects, but a candidate will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other). A candidate will be admitted to examination in Chemistry and Physics, and in Elementary Biology on producing evidence of having passed the required Preliminary Examination and of having received instruction in these subjects at a recognised institution. A candidate rejected in one part or more of the First Examination will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection, and he will be re-examined in the subject or subjects in which he has been rejected. If referred in Chemistry, Physics, or Biology he must produce evidence of further instruction at a recognised institution. Any candidate who shall produce satisfactory evidence of having passed an examination for a degree in Medicine in any of the subjects of this examination conducted at a university in the United Kingdom, in India, or in a British colony will be exempt from examination in those subjects.

The fees for admission to the *First Examination* are as follows: For the whole examination, First Admission, £10 10*s.*; re-examination in Chemistry, £3 3*s.*; re-examination in Physics, £2 2*s.*; re-examination in Biology, £2 2*s.* Second Conjoint: This examination is in two parts—viz.: Part I., Anatomy and Physiology; Part II., Materia Medica and Pharmacology. A candidate must have attended at a recognised medical school, lectures on Anatomy, Physiology, and a course of Practical Physiology and Histology, and have dissected for twelve months during the ordinary sessions. He must also attend three months' lectures or demonstrations in Pharmacology and receive instruction in Practical Pharmacy. Part II. may be passed at the same time as Part I., or before or after that part, provided the conditions of admission to the whole examination have been fulfilled. The study of Anatomy and Physiology before passing in two of the three subjects of the first examination is not recognised. If rejected, a candidate before being admitted to re-examination must continue his studies at a recognised medical school for not less than three months.

Second Examination: £10 10*s.*; re-examination in Part I., £6 6*s.*; re-examination in Part II., £3 3*s.*

The subjects of the *Third* or *Final Examination* are: Part I., Medicine, including Medical Anatomy, Pathology, Therapeutics, Forensic Medicine, and Public Health. Part II., Surgery, including Pathology, Surgical Anatomy, and the use of Surgical Appliances. Part III., Midwifery and Diseases Peculiar to Women. Candidates may present themselves for Parts I., II., and III. of the examination separately or together at the expiration of not less than two years (24 months) from the date of passing the Second Examination on production of the certificates of study required for the respective parts, provided that the examination is not completed before the expiration of five years from the date of passing the Preliminary Examination.

The fees for admission to the *Third* or *Final Examination* are as follows: Third Examination: £21; re-examination in Part I., Medicine, £6 6*s.*; Part II., Surgery, £6 6*s.*; Part III., Midwifery and Diseases of Women, £4 4*s.* Members of English, Scotch, or Irish Universities £5 5*s.* for first admission to the examination and £36 15*s.* for the diplomas.

A candidate referred on the *Third* or *Final Examination* will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection and will be required, before being admitted to re-examination, to produce a certificate, in regard to Medicine and Surgery, of having attended the Medical and Surgical Practice, or the Medical or Surgical Practice, as the case may be, during the period of his reference; and in regard to Midwifery and Diseases Peculiar to Women a certificate of having received, subsequently to the date of his reference, not less than three months' instruction in that subject by a recognised teacher.

Students of recognised universities in England, Scotland, and Ireland, who have passed examinations for a degree in Medicine at their universities in the subjects of the First and Second Examinations of the Examining Board, may enter for the Final Examination at the expiration of two years from the date of passing in Anatomy and Physiology on production of the required certificates.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First and Second Examinations of the Examining Board may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Psychological Medicine and in Ophthalmic Medicine and Surgery. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of an Indian, Colonial, or Foreign University. Particulars and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, London, W C. 1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON: THE MEMBERSHIP AND FELLOWSHIP.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—Every candidate must have attained the age of 25 years, and be already registered or have passed a qualifying examination in accordance with the Medical Act of 1886, or obtained the degree of Doctor or Bachelor of Medicine at a University in the United Kingdom, in India, or a British colony, or a foreign qualification, for which the courses of study and the examinations have been adjudged by the Censors' Board to be satisfactory. The nature and extent of this examination will, in the case of each candidate, be determined by the Censors' Board. All other candidates must produce proof of having passed the examinations required for the Licence of the College. The examination is directed partly to pathology and partly to the practice of medicine and may be modified in circumstances to be ascertained by application to the Registrar. The fee for admission as a Member of the College is 40 guineas, except when the candidate for Membership is a Licentiate of the College, in which case the fee already paid for the Licence shall be deducted from the 40 guineas. The fee for the examination is £6 6*s.*

Fellowship.—The *Fellows* are selected annually from the ranks of the *Members* by the Comitia of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND: THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology, and those of the Second Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly *vivâ voce* and include the examination of patients and the performance of operations on the dead body. The examinations are held in May and November.

The fees for examination are:—First Examination, first admission 8 guineas, and for each readmission 5 guineas. Second Examination, each admission, 12 guineas. Of such examination fees 20 guineas will be reckoned as part of the fee payable upon admission to the Fellowship. The fee to be paid upon admission to the Fellowship is 30 guineas, except when the candidate is a Member of the College, in which case the fee is 20 guineas.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Member-

ship. A candidate who is not a Member is admissible after passing the First and Second Examinations of the English Conjoint Board, or the equivalent examinations in his University, on the production of certificates of attendance upon certain prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination, on producing satisfactory evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

The Regulations may be obtained on application to the Director of Examinations, Examination Hall, Queen-square, Bloomsbury, London, W.C. 1.

SOCIETY OF APOTHECARIES OF LONDON.

The Primary examination is held quarterly in two parts. Part I. Elementary Biology; Chemistry, Chemical Physics; Practical Chemistry; and Materia Medica and Pharmacy. Part II. includes Anatomy, Physiology, and Histology. This examination cannot be passed before the completion of twelve months' Practical Anatomy with Demonstrations, and these subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final examination is held monthly except in September. It is in two sections. Section I. consists of three parts. Part I. Principles and Practice of Surgery, Surgical Pathology, and Surgical Anatomy, Operative Manipulation, Instruments, and Appliances. Part II. Medicine, Pharmacology, Pathology, and Morbid Histology; Forensic Medicine, Hygiene, Theory and Practice of Vaccination; and Mental Diseases. Part III. includes Midwifery, Gynæcology, and Diseases of New-born Children and the Use of Obstetric Instruments and Appliances. Section II. of the Final examination consists of two Parts. Part I. Clinical Surgery; Part II. Clinical Medicine and Medical Anatomy.

The course of study for the *Final examination, Section I.*, includes attendance on the Surgical and Medical Practice, with Post-mortem Examinations, at a hospital connected with a medical school for a period of two winter and two summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The course of medical study must extend over 45 months, and the offices of dresser or clinical clerk must be held at a hospital or other institution recognised by the Society. Two years must elapse after a candidate has passed the examination in Anatomy and Physiology before sitting for any part of the Final examination.

The course of study for the *Final examination, Section II.*, includes either attendance on the Practice of Medicine and Surgery at a hospital or other institution recognised by the Society for a further period of 12 months, or six months as above and six months as a pupil of a registered practitioner holding a public medical or surgical appointment, or attendance at two special hospitals for six months (three months at each hospital), and for six months at a general hospital, all such hospitals to be recognised by the Society. Evidence shall also be given of practical instruction in Infectious Diseases and in Mental Diseases (at a lunatic asylum or in the wards of an institution containing a special ward set apart for the treatment of mental diseases), and in any two of the following subjects: Ophthalmic Surgery, Laryngology with Rhinology and Otology, Dermatology, and Diseases of Children. Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Licence is 20 guineas. Female candidates are admitted to examinations. The examination offices are open from 10 A.M. to 4 P.M.: on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Secretary, Court of Examiners, Society of Apothecaries of London, Blackfriars, E.C. 4.

METROPOLITAN ANCILLARY SCHOOLS AND HOSPITALS AFFORDING FACILITIES FOR CLINICAL OBSERVATION.

The institutions which follow provide to the medical student and medical graduate facilities for different forms of instruction and clinical observation. In each case further information can be obtained from the secretary of the hospital.

THE SEAMEN'S HOSPITAL SOCIETY possesses three hospitals—the *Dreadnought* Hospital at Greenwich, 250 beds, and the Branch Hospital in the Royal Victoria and Albert Docks, E., 50 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, London, N.W. 1; and the Angas Home 30 beds. It has also two Dispensaries—one in the East India Dock-road and the other at Gravesend—from which the patients are transferred to the hospitals. Secretary: Mr. P. J. Michelli, C.M.G.

WEST LONDON HOSPITAL, Hammersmith, W. 6.—This hospital has 160 beds, all of which are constantly in use. 2074 in-patients and 32,631 out-patients, whose attendances numbered 174,625, were treated last year. Attached to the hospital is the West London Post-Graduate College. The practice of the hospital is reserved exclusively for qualified men, no junior students being admitted. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards every morning and afternoon. Lectures and demonstrations are given daily. Special Classes are held in Diseases of the Throat and Nose, Skin, and Eye, and in Gynæcology, Medical Electricity, Operative Surgery, Bacteriology, Anæsthetics, Intestinal Surgery, Medical and Surgical Diseases of Children, Blood and Urine, Clinical Microscopy, Tropical Medicine, Cystoscopy, Venereal Diseases, and Operative Ophthalmology. The accommodation for post-graduates consists of a large lecture room, together with reading, writing, and class rooms, &c. The hospital has a fully equipped pathological laboratory at which instruction is given in elementary bacteriology, a class being held every month. The fees for hospital practice, including lectures, are £6 6*s*. for three months, or £15 15*s*. for one year. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave. Further information can be obtained on application to the Deans, Dr. Arthur Saunders and Mr. Bishop Harman, at the Hospital. Secretary of the Hospital: Mr. H. A. Madge.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway-road, N. 7.—This hospital is recognised by the Examining Board in England of the Royal Colleges of Physicians and Surgeons as a place of study during the fifth year of the medical curriculum. Besides the Honorary Staff there are six Anæsthetists, Pathologist, Resident Medical Officer, one resident House Physician, three resident House Surgeons, and resident casualty officer. The hospital contains 230 beds, which are fully occupied. There is also a ward for children under five years of age. The large rectangular and circular wards, each of which contains 35 beds, the observation wards, the two operation theatres, general and special out-patient and pathological departments, are specially designed with a view of offering the greatest facilities for clinical work. There is also a well-appointed electro-therapeutic department. The Pathological Department has been extended and is under the control of a Director of Clinical Pathology. The Reckitt Convalescent Home at Clacton-on-Sea belongs to the hospital. It contains 30 beds. Special departments have also been established for the treatment of tuberculosis and venereal diseases. A Hospital of Recovery containing 60 beds has now been established at "Summerlee," East Finchley, which is placed at the disposal of discharged soldiers and sailors as well as civilians. Medical practitioners are cordially invited to see the general and special practice of the hospital. Demonstrations are given daily in the wards and out-patient departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments and may receive certificates at the end of their terms of office.

Further particulars from the Secretary of the Medical Committee at the Hospital.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—This general hospital is in the midst of a densely populated neighbourhood of more than half a million inhabitants. It contains medical, surgical, gynæcological, and children's wards, having 125 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin diseases, plastic surgery, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are four Resident Medical Officers, and Clinical Assistants are appointed under certain conditions. Further particulars in regard to the hospital may be obtained from Mr. H. W. Carson, Secretary to the Medical Committee, 111, Harley-street, W.; or from Dr. A. J. Whiting, Dean of the North-East London Post Graduate College, 19A, Cavendish-square, W. Secretary: Mr. F. W. Drewett.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. (Established 1873; Incorporated 1917).—The hospital contains 120 beds. The in-patients in 1919 were 1223, and the out-patients and casualties numbered 16,466 new cases. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Mondays at 2 P.M., Tuesdays, Wednesdays, Thursdays, and Fridays at 9 A.M.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.—The Hampstead General Hospital (Haverstock Hill) and the North-West London Hospital (formerly at Kentish Town) have been amalgamated since 1907. The Hampstead General Hospital (128 beds—viz., 102 free, 6 isolation, &c., and 20 paying or contributory) accommodates the in-patients from the districts hitherto served by both hospitals. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients Department, Bayham-street, Camden Town. Further particulars from the secretary at the hospital (Haverstock Hill, N.W. 3).

ELIZABETH GARRETT ANDERSON HOSPITAL, 144, Euston-road, N.W.—A number of the students of the London School of Medicine for Women work in the E.G.A. Hospital under the visiting staff, and in return for much valued clinical gynæcological teaching they perform the duties assigned to students in the wards of a general hospital. Post-graduate courses in the treatment of venereal disease are held in conjunction with the London School of Medicine for Women. Secretary: Miss Imogen H. Murphy.

THE SOUTH LONDON HOSPITAL FOR WOMEN, South Side, Clapham Common, S.W.; Out-patient Department: 86-90, Newington Causeway, S.E.—This hospital, officered entirely by medical women, is a general hospital for women, girls, and small children of both sexes, and provides accommodation for 80 patients. All diseases are treated with the exception of acute infectious fevers and mental disease. There are Ophthalmic, X Ray, and Pathological Departments. The hospital is a centre for the treatment of venereal diseases under the Public Health (Venereal Diseases) Regulations, 1916. The provision of additional facilities for post-graduate training for medical women is one of the special objects of the hospital. The number of in patients treated during the year 1919 was 1142. At the Out-patient Department in Newington Causeway 6942 new cases were treated during the past year, the total number of out-patient attendances amounting to 33,015. Clinical assistants (qualified women only) are from time to time appointed in the Out-patient Department. Secretary: Miss M. E. Ridler.

FRENCH HOSPITAL AND DISPENSARY, Shaftesbury-avenue, W.C.—This hospital, which was founded in 1867 to afford medical treatment for poor foreigners who speak the French language, has 74 beds. The Convalescent Home and Retreat for Aged French People at Brighton contains 61 beds. Secretary: Mr. G. Pondepeyre.

ITALIAN HOSPITAL, Queen-square, W.C.—This institution was established in 1884 for the maintenance and medical treatment of Italian and Italian-speaking people, irrespective of their religious and political opinions, who may be suffering from sickness or bodily infirmity, but the sick poor of any nationality are also admitted for treatment. The institution also provides surgical and medical relief to Italians and others not being inmates of the hospital. It has 50 beds.

GERMAN HOSPITAL, Dalston, E. 8.—This hospital was founded in 1845 with the object of supplying medical aid to poor people speaking the German language and for cases of emergency and of accident. It has 124 beds, including a sanatorium with 10 beds. Also a convalescent home at Hitchin with 40 beds, occupied, since 1915, by convalescent British soldiers.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC (Albany Memorial), Queen-square, Bloomsbury, W.C.—The hospital, with the Finchley branch, and branches in Bloomsbury and Clapham Park, contains 270 beds and cots. The physicians attend every Monday, Tuesday, Thursday, and Friday at 2 P.M. In- and out-patient practice at that hour. Clinical Clerks are appointed under the in-patient and out-patient physicians. Lectures are given on Tuesdays and Fridays at 3.30. The hospital has been recognised by the Conjoint Board for England as a place where part of the fifth year may be devoted to clinical work. All communications concerning clinical appointments, lectures, hospital practice, and fees should be addressed to the Secretary at the hospital.

HOSPITAL FOR EPILEPSY AND PARALYSIS, &c., Maida Vale, W. (85 beds).—Both in-patient and out-patient departments of this hospital are open free to students as well as to medical graduates. Secretary and General Superintendent: Mr. H. W. Burleigh.

WEST-END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, PARALYSIS, AND EPILEPSY, 73, Welbeck-street, W.—Graduates in medicine and senior students may attend demonstrations in the Out-patient Department. No fees are charged. The Savill Prize and Medal are at present in abeyance, as well as routine demonstrations by the staff.

BETHLEM ROYAL HOSPITAL, St. George's-road, S.E.—This hospital is open for the admission of two Resident House Physicians who have recently obtained their diplomas to practise Medicine and Surgery. They are permitted to reside in the hospital for a term generally not exceeding six months, commencing May 1st and Nov. 1st, and are provided with apartments, complete board, attendance, laundry, and a salary at the rate of £100 per annum. They are under the direction of the Physician Superintendent and are elected by the Committee from candidates whose testimonials appear to be most satisfactory. The students of certain specified London Medical Schools receive Clinical Instruction in the wards of the hospital and qualified practitioners and other students may attend for a period of three months on payment of a fee. A department for nervous diseases has been instituted in a building quite apart from the main hospital. Neurological and early mental cases are dealt with.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—The hospital contains 333 beds. The Sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six House Physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. Pupils are admitted to the practice of the hospital: terms £2 2*s.* for one month; three months, £4 4*s.*; six months, £7 7*s.* Clinical Demonstrations are given throughout the year by members of the medical staff. Clinical Assistants are appointed to the Assistant Physicians in the out-patient department and Clinical Clerks to the Physicians in the wards. The hospital has been recognised by the Conjoint Board for England as a place where six months of the fifth year may be spent in clinical work. The medical practice of the hospital is also recognised by the University of London, the Apothecaries' Society, and the Army and Navy and Indian Medical Boards. Dean of the Medical School: Dr. L. S. Barrell, from whom particulars of lectures, clinical appointments, and hospital practice can be obtained.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—During the past year 1052 in-patients have been treated in the wards. The out-patients treated during 1919 numbered 10,955. Address "Secretary of the Medical Committee."

ROYAL CHEST HOSPITAL (for all affections of the heart and lungs), City-road, E.C. (80 beds.)—This hospital provides accommodation for 80 in-patients. Expenditure for 1919 £14,699, income £13,605. The attendance of out-patients averages 25,000 annually. Secretary: Mr. A. T. Mays.

THE MOUNT VERNON HOSPITAL FOR TUBERCULOSIS AND DISEASES OF THE LUNGS AND HEART, NORTHWOOD, CENTRAL OUT-PATIENT DEPARTMENT, Fitzroy-square, W.—The hospital contains 110 beds. Number of in-patients, 440; out-patients, 2330. Resident Medical Staff. Clinical Demonstrations are given by the Visiting Medical Staff at the hospital at Northwood. Clinical assistants are appointed to physicians in the wards and in the out-patient department. Secretary: Mr. W. J. Morton. Offices: 7, Fitzroy-square, W.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL AND MIDWIFERY TRAINING SCHOOL, Marylebone-road, N.W.—This hospital receives about 2000 patients annually, besides having a large out-patient department. Medical pupils are received at all times of the year. Pupils have unusual opportunities of seeing obstetric complications and operative midwifery, on account of the very large number of primiparous cases—nearly one-half of the total admissions. Clinical instruction is given on the more important cases which present themselves. Special Lecture-demonstrations are given by members of the staff. Certificates of attendance at this hospital are recognised by all the Universities, Colleges, and licensing bodies. Pupil midwives and monthly nurses are received and specially trained. A Residential College provides accommodation for five men at a time, students and qualified practitioners, and is opposite the hospital, with which it is in telephonic communication. Arrangements have been made for Medical Students to receive the preliminary instruction in Practical Midwifery recommended by the General Medical Council. Women students are received. For further particulars application should be made to Mr. Arthur Watts, Secretary, at the hospital.

THE HOSPITAL FOR WOMEN, Soho-square, W.—In connexion with the out-patient department there has been for some years a well-organised Clinical Department. The appointments are open to qualified medical men and women. Every facility is afforded them by the gynæcologists in the out-patient department of obtaining experience in diagnosis and treatment and the practical use of instruments. Fee for one month £2 2*s.*; for each subsequent month the same. The hospital contains 68 beds. In the out-patient department there were over 4000 new cases during the past year, the total number of out-patient attendances being 14,500. This large number affords exceptional opportunities for examining and studying most of the varieties of the diseases of women. Applications should be made to the Secretary, Mr. Alfred Hayward.

SAMARITAN FREE HOSPITAL FOR WOMEN, Marylebone-road, N.W.—Qualified practitioners are admitted as clinical assistants to both the in- and out-patient departments. Demonstrations are given daily in both departments. The fees, payable in advance, are £3 3*s.* for three months. Full particulars may be obtained on application to the Secretary at the hospital. There are 70 beds. Secretary: Mr. G. H. Hawkins.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Glamis-road, Shadwell, E.—The hospital maintains 130 cots, and on an average 245 out-patients are seen daily. Clinical instruction is given by the physicians and surgeons to the hospital, which is recognised by the Conjoint Board for England as a school of medical teaching for students in the fifth year of the curriculum. All particulars may be obtained on application to the Secretary. Two clinical clerkships for qualified or unqualified students are open every three months subject to reappointment if desired. Clinical assistants (qualified men only) are from time to time appointed in the out-patient department. Any additional information may be obtained on applying to Mr. W. M Wilcox, the Secretary, at the hospital.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. 1, contains 240 beds, besides 30 beds at the Branch Hospital, Highgate. The hospital having been recognised by the Conjoint Board for England as a place where, under the new curriculum, six months of the fifth year may be spent in clinical work, the practice is arranged to meet this need and is open to students of both sexes who have completed four years of medical study and also to qualified medical men and women. The medical staff are recognised by the University of London as teachers in Diseases of Children. Arrangements have also been made with University College Hospital and the London School of Medicine for Women for the routine admission of their students of both sexes to clerkships and dresserships in the wards. Appointments are made every three months to six medical clerkships, which are open to students of the hospital. Clinical instruction is given daily by members of the visiting staff. Fees for hospital practice, one month, £2 2*s.*; three months, 5 guineas; perpetual ticket, 10 guineas. Clinical Clerks, 1 guinea for one month. Ophthalmological Clerkships.—Clinical Clerks are appointed once a month. Fees £1 1*s.* for one month's attendance. Pathological Clerkships.—Facilities are afforded for obtaining theoretical and practical instruction in Clinical Pathology and Bacteriology in the Pathological Laboratories. Clerks attend for about four hours daily. Fees: For one month, £3 3*s.*; for two months, £5 5*s.*; for three months, £6 6*s.* A reduction is made in the case of those already holding tickets for general attendance at the hospital. Time so spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge, and by the Conjoint Board for England as part of the approved curriculum for students entering for a final examination. These appointments are open to students of all recognised medical schools. In addition, special courses in post-graduate work are held throughout each term of the year, as well as routine post-graduate instruction daily. Details may be obtained by application to the dean or secretary at the hospital. The medical school is a constituent part of the new London Post-Graduate Association. Acting Secretary: Mr. James McKay.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark Bridge-road, S.E.—This hospital contains 76 cots and a very extensive Out-patient Department. About ten clinical assistants (either sex), to work with the Honorary Medical Staff for Out-patients, are appointed quarterly for a period of three months; there is no salary attached to these posts; but, on the other hand, no fees are charged. Secretary: H. C. Staniland Smith.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—The hospital contains 104 beds and has a large out-patient department (over 1200 weekly); the home at Broadstairs has 50 beds. Out-patients are seen as under:—Diseases of the Eye: Tuesday, 2 P.M. Diseases of the Skin: Wednesday, 1.30 P.M. Whooping-cough Cases: Friday, 2.30 P.M. Dental Cases: Thursday, 1.30 P.M. Medical and Surgical Cases: Mornings at 9.30. Accidents and urgent cases are admitted at any time. Secretary: Mr. H. G. Evered.

QUEEN'S HOSPITAL FOR CHILDREN (*late North-Eastern Hospital for Children*), Hackney-road, Bethnal Green, E. 2. (Telephone 305 Dalston.) For the sick children of the poor under 14 years of age. Established 1867. 134 beds in London and 36 at the seaside branch. "Little Folks" Home, Bexhill. —During the past year 1481 in-patients and 53,119 out-patients (attendance 107,075) were received. The surgeons attend on Tuesdays and Wednesdays at 1.45 P.M. and Fridays and Saturdays at 9.30 A.M.; the physicians daily at 1.45 P.M., except Saturday, 9.30 A.M., and Wednesday and Friday, 9.30 A.M., as well as 1.45 P.M. The practice of the hospital is open to students by arrangement with the medical staff. Applications should be made to the Secretary, Mr. T. Glenton-Kerr.

BELGRAVE HOSPITAL FOR CHILDREN, Clapham-road, S.W.—Clinical Assistants (men or women) are from time to time appointed to the members of the Visiting Staff attending in the Out-patient Department at this hospital, and facilities are given for attendance in the wards.

ALEXANDRA HOSPITAL FOR CHILDREN WITH HIP DISEASE, Queen-square, W.C.—At this hospital students who have obtained a recommendation from their teachers can attend to see the practice. The out- and in-patients' clinic is held on Mondays and Thursdays at 3 P.M.

ROYAL LONDON OPHTHALMIC HOSPITAL (Moorfields, 1804–1899), City-road, E.C. 138 beds.—This hospital, known as Moorfields Eye Hospital, was moved in 1899 to larger buildings in City-road. There were 2339 in-patients, the out-patients were 41,725, of whom 36,101 were new

out-patients, and the attendances were 98,186. Operations are performed daily from 10 A.M. to 1 P.M., and four surgeons attend on each day. Students are admitted to the practice of the hospital. Fee for six months, £3 3*s.*; perpetual, £5 5*s.* Special courses of instruction, which extend over a period of five months are given by members of the Surgical Staff; beginning in October and March. A composition fee of 24 guineas (£25 4*s.*) will entitle students to a perpetual ticket, and will admit them once to all the lectures and classes and to the examination for the hospital's full certificate. Students of the hospital are eligible for the offices of house surgeon or clinical and junior assistants. Junior assistants are appointed every three months. Any further information will be furnished by Mr. Robert J. Bland, Secretary Superintendent.

ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, King William-street (next door to Charing Cross Hospital), Strand, W.C. 2.—The hospital contains 40 beds. Out-patients, who number over 13,000 annually, are seen daily at 1 P.M., and operations are performed in the theatre at 3 P.M. The practice of the hospital is open to both men and women practitioners and students. Clinical evenings, at which interesting cases are shown and discussed, are held twice each term at 8 P.M. In addition to the ordinary clinical instruction, a systematic course of Lectures and Practical Classes commences in October, January, and May. Lectures in this course are given daily (except on Saturday) at 4.30 P.M., including all subjects required by candidates for the D.O.M.S. R.C.P. & S. Eng., Part II., and practical instruction is given in Operative Surgery and Ophthalmic Pathology and Bacteriology. Fees: One month, £1 1*s.*; three months, £2 2*s.*; six months, £3 3*s.*; perpetual, £5 5*s.*; composition fee for perpetual ticket and attendance at classes (except Operative Surgery and Pathology, for which fee in each case is £2 2*s.* per course), £10 10*s.* Students of the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant, and senior or junior clinical assistant. Full details can be obtained on application to the Dean.

ROYAL EYE HOSPITAL, St. George's-circus, Southwark, S.E.—There are 40 beds and 2 cots. There were 56,377 attendances in the Out-patient Department last year, and the new patients numbered 22,654. Out-patients are seen daily 1.30 to 2.30 P.M. Post-graduate course: The new term beginning in October. Dean: Mr. A. D. Griffith.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, St. Pancras, W.C.—This hospital has 40 beds and possesses facilities for clinical teaching daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on refraction and other subjects are given during the winter months, commencing in October. The out-patient work begins at 1 o'clock, and operations are performed daily between 2 and 4 o'clock. This school is recognised as a teaching institution by the Universities of London and Oxford, and the Conjoint Board of the Royal Colleges of Surgeons and Physicians. The school has also undertaken to receive a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. Secretary: H. R. S. Druce.

WESTERN OPHTHALMIC HOSPITAL, Marylebone-road, N.W.—16 beds. Out-patient attendances 20,000. Both In-patient and Out-patient Departments of this Hospital are open to medical graduates. Fees £1 1*s.* per three months. Honorary Secretary: W. H. Burleigh

HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W. (with which is amalgamated The London Throat Hospital, Great Portland-street).—Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 5 P.M., and on Tuesdays and Fridays from 6 30 to 9 P.M. The hospital contains 60 beds for in-patients. There is an annual out-patient attendance of over 60,000. Minor operations are performed Tuesdays, Wednesdays, and Thursdays, at 9 30 A.M. Major operations are performed on Tuesdays, Wednesdays, Thursdays, and Fridays, at 10 A.M. Also Thursdays and Fridays at 2 P.M. Practitioners and medical students are admitted to the practice of the hospital at a fee of £5 5*s.* for three months, £7 7*s.* for six months, or £10 10*s.* for perpetual studentship. From amongst the students junior clinical assistants are appointed periodically. For terms and further information apply to the Dean, Mr. Lionel Colledge.

CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn-road.—Clinical lectures: The hospital is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinique. Medical practitioners are invited to visit the wards, and are welcomed both in the operating theatre, when they are desirous of viewing the major operations, and in the out-patient operating room when minor operations are being performed. Clinical lectures are delivered from time to time, particulars of which are given in the medical journals, and at the hospital. Systematic classes and courses of instruction and demonstrations. Three courses of instruction are open to practitioners attending the hospital: First, the course in methods of examination and diagnosis; second, the course of systematic instruction in the diseases of the nose, throat, and ear; and third, the operative surgery class. The course in methods of examination and diagnosis is introductory in character. It comprises lessons of practical teaching in the actual examination of patients and in the manipulation of instruments. Systematic instruction in Diseases is more advanced. It consists of over 30 lessons in all on pathology, diagnosis, and treatment. Minute details in operative surgery are not gone into, as this is left to the operative surgery class. Full syllabus will be sent on application to the Secretary.

THE METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL.—The hospital is in Fitzroy-square, W. The Out-patient Department is opened daily at 2.30 P.M. to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 10 A.M. Fee for one month's attendance at the hospital £2 2*s.*, and for three months £3 3*s.* Clinical Assistants are appointed as vacancies occur, and have responsible duties.

ROYAL EAR HOSPITAL.—This Hospital is now the Ear, Nose and Throat Department of University College Hospital. All the clinics are held at the latter Hospital.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C. (Founded 1835.)—The hospital contains for men and women 56 beds. Operations are performed on Mondays, Wednesdays, and Thursdays at 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Average out-patient attendances, 4283 per year. Average in-patients, 672 per year.

ST. PETER'S HOSPITAL FOR STONE AND OTHER URINARY DISEASES, Henrietta-street, Covent Garden. Established 1860. New Hospital opened 1882.—The hospital contains 30 beds for men and 2 beds for women and children. Medical practitioners and students are invited to the clinical instructions which are given in the wards and out-patient department daily, and to the operations in the theatre on Mondays, Wednesdays and Fridays at 2 P.M. Average beds occupied daily, 30; average out-patients seen daily, 100.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C. 2.—The in-patient department, 40 beds, is at 262, Uxbridge-road, W. 12. The out-patient practice is open to the medical profession every day at 2 and every evening (except Saturday) at 6. At the afternoon clinics demonstrations on the different diseases presenting themselves are given. Venereal Diseases, under the Government scheme, are admitted at all clinics. The X ray department is open every afternoon except Saturday. The Chesterfield Lectures are given on Thursdays at 6 P.M., October to March, commencing Oct. 14th. At the end of the course the Chesterfield medal may be competed for by those who have attended three-fourths of the lectures. Special laboratory courses in Pathology and Bacteriology of the Skin may be arranged for.

LONDON LOCK HOSPITAL AND RESCUE HOME.—In the Female Hospital at Harrow-road, W. 9, there are 162 beds, and 636 patients were admitted in 1919. In the Male Hospital and Out-patient Department in Dean-street, Soho, W.,

there are 43 beds, which during 1919 accommodated 475 patients. 62,575 out-patients were treated. 12,000 injections of the substitutes for salvarsan were made in 1918. Male patients are seen at 91, Dean-street, on Mondays and Tuesdays from 1 to 2 P.M. and from 6 to 8 P.M.; on Wednesdays from 6 to 8 P.M.; on Thursdays at 11.30 A.M. and 5–7 P.M. (female patients); on Fridays from 5 P.M. (female patients); and on Saturdays from 2 to 4 P.M. (males). Pathological Department, Tuesdays at 6.30 P.M. Days for intravenous injections 91, Dean-street, W. 1, Tuesdays and Saturdays at 9 A.M. (men); women, Thursdays at 5.30 P.M., Fridays at 5.30 P.M. Female patients are seen at 283, Harrow-road, Paddington, Tuesdays and Thursdays at 2 P.M., and irrigations are given every evening from 6 to 8 P.M. Secretary: Henry J. Eason. Head office: 283, Harrow-road, W. 9.

ENGLISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

Under this heading we include all the hospitals which are recognised by the English Royal Colleges for a part of the required attendance on medical and surgical practice, for medical clerkships, and surgical dresserships. The list includes nearly every hospital of a general character in the country having more than 150 beds, though occasionally a large hospital is admitted because equally good opportunities are afforded to students at other institutions in its neighbourhood, while a small hospital may be included because no such facilities for study are present elsewhere. The list is arranged alphabetically as to the town where the hospital is located. Most of the largest general hospitals of the kingdom have already been noticed in connexion with the Universities.

BATH ROYAL UNITED HOSPITAL, Bath.—This hospital contains 130 beds, and possesses a fine library. Secretary: Mr. J. M. Sheppard. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men) from 5 to 7 P.M.

BEDFORD COUNTY HOSPITAL, Bedford.—This hospital has 100 beds, with X Ray and Pathological Departments, and a convalescent home in connexion with the institution. Secretary: Mr. Beauchamp Wadmore.

BRADFORD ROYAL INFIRMARY, Bradford.—This hospital contains 215 beds. The material passing through the surgical wards consists of major operations, chiefly abdominal, and gynæcological work, and affords excellent facilities for either students or post-graduates. Plans for a new hospital of 382 beds have been adopted, and the building operations will be commenced as soon as the funds in hand will allow.

ROYAL SUSSEX COUNTY HOSPITAL, Brighton (220 beds).—This hospital affords ample facilities for students, possessing a large out-patient department, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years on payment in advance of such a fee, not exceeding 20 guineas, as the Board of Management shall direct.

KENT AND CANTERBURY GENERAL HOSPITAL, Canterbury.—The hospital contains 110 beds. Pupils of the staff are admitted to the practice of the hospital. Operations four days of the week. There is an Ophthalmic Department, a Venereal Clinic, an Orthopædic Department, &c. Secretary, Mr. F. P. Carroll.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry (established 1840).—This hospital contains 335 beds, and a new wing as well as theatre and kitchens have been added. Clinical students are received, and there are paying wards. Secretary: Miss R. Hooper.

DERBYSHIRE ROYAL INFIRMARY, Derby.—This hospital contains 320 beds. It was founded in 1810, and was entirely rebuilt and enlarged 1892–1915 on the most modern lines at a cost of over £144,000. There is a separate ophthalmic block of 33 beds, a separate children's block of 34 beds, and a special department for gynæcological cases. There are three resident house surgeons and a resident house physician. There are also well-equipped orthopædic, X ray, electrical, and Finsen light departments. Registered medical students are admitted to witness the medical and surgical practice on payment of 10 guineas annually.

ROYAL DEVON AND EXETER HOSPITAL, Exeter.—The hospital contains 200 beds, extending to 300 in 1922 (including special children's ward) and has a good library, museum, dissecting room, and post-mortem room. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. For particulars as to fees, &c., apply to the Matron. A new wing was added in 1897. Arrangements may be made by which gentlemen in practice desiring to increase their qualifications may have the use of the museum and library and other facilities and by which students may attend midwifery. A new Operating Theatre was opened in 1906 (the gift of Mrs. Nosworthy of Newlands, Dawlish, Devon). The Electrical Treatment Department (the gift of Mrs. M. A. Sanders) was opened in 1907 by Lady Duckworth-King. A department was opened in 1917 for the treatment of genito-urinary diseases; there are three sessions per week, two for men at 3 P.M. and 7 P.M., and one for women at 3 P.M.

WEST OF ENGLAND EYE INFIRMARY, Exeter.—Secretary: Mr. W. W. Beer. The infirmary contains 64 beds. Students of the Exeter Hospital can attend the practice of the Eye Infirmary. Patients for the year ending Michaelmas, 1919, 2664. A ward is set aside for newly-born babies suffering from infectious eye diseases. The mothers are accommodated with their babies.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION, Gloucester.—This hospital, which was granted the title of "Royal" on the occasion of King Edward VII.'s visit to Gloucester in the year 1909, has 140 beds. Secretary: Captain G. Hurford. In-patients, 1709; out-patients, 7000. An electrical and massage department has been established and venereal and neurological clinics opened. Also ear, nose and throat department.

NORTH STAFFORDSHIRE INFIRMARY, Hartshill, Stoke-on-Trent.—The New Infirmary, opened in 1869, is built on the pavilion plan, has accommodation for about 250 patients, including Children's wards, and a special department for the treatment of Diseases of the Eye, a special X Ray and Electrical Department, a special department for the treatment of Diseases of the Ear, Nose, and Throat, a special orthopædic department, and venereal diseases clinics, so that there are excellent facilities for acquiring a practical knowledge of the profession. During the last six years the sum of £35,000 has been spent on new buildings and alterations. A new Out-patient Department, costing £12,000, a new Children's Ward of 30 beds, a new Pathological Department, and a second large Operation Theatre are amongst the structural improvements already completed. The whole institution is now equipped in a thoroughly up-to-date manner. Secretary and House Governor: Mr. W. Stevenson.

HULL ROYAL INFIRMARY, Hull.—This hospital contains 256 beds, and since its establishment in 1782 until the erection of the circular wards in 1907 has undergone steady additions and improvements. A branch convalescent home and sanatorium for consumption at Withernsea are special features of the charity.

LEICESTER ROYAL INFIRMARY, Leicester.—Instruction in the infirmary for first-year students is duly recognised by the various examining bodies. At the General Infirmary there are 230 beds, and at the Children's Hospital in connexion 70; total 300. A new wing containing 100 beds was recently opened by H.R.H. the Duchess of Argyll. A reconstruction scheme has been carried out, and £120,000 spent on bringing the accommodation of the institution to a modern standard of efficiency. This scheme has included the provision of two modern operating theatres, and a self-contained out-patients' department. The Children's Hospital has been reconstructed and enlarged by the addition of a third ward at a cost of £14,500. Open-air balconies on all three floors are a feature. A central sterilising department has been provided. Pathological Laboratories and post-mortem rooms have recently been opened at a cost of £11,000, also an orthopædic out-patient department at a cost of £9500, £5000 of which was provided by the Freemasons of the province as their war memorial. The Nurses' Home is at present undergoing enlargement for 60 additional bedrooms. A new south-west wing, to contain 100 beds, has been approved by the Governors and will shortly be proceeded with. Funds are being raised for the

foundation of a City University, and a splendid site has been presented by Mr. T. Fielding Johnson, J.P., an ex-chairman of the Royal Infirmary. There are eight resident salaried medical officers at the Infirmary—viz., four house surgeons, one house physician, one assistant house physician, and two dressers. Dressers are given an honorarium. House Governor and Secretary: Mr. Harry Johnson.

NORTHAMPTON GENERAL HOSPITAL, Northampton.—Two new wings were opened in 1904 and the old buildings entirely renovated and rearranged. The number of beds is 231, 34 of which are occupied by discharged disabled pensioners. Non-resident pupils are received and have every opportunity of acquiring a practical knowledge of their profession. The fee is £10 10s. Pupils can be received at any time. An up-to-date Pathological Laboratory has recently been erected.

NORFOLK AND NORWICH HOSPITAL, Norwich.—This hospital has at present 350 beds. There is a convalescent home at Cromer, and a large staff of visiting nurses is maintained. Since January last Post-graduate Courses have been held at this institution, and will be continued next year during January, February, March, and April. Secretary: Mr. Frank Inch.

NOTTINGHAM GENERAL HOSPITAL.—At the present time there are 233 beds available for civilian patients. The accommodation of sick and wounded soldiers from overseas was a great feature at this hospital, which is fully equipped in every branch of medicine and surgery.

SOUTH DEVON AND EAST CORNWALL HOSPITAL, Plymouth.—This hospital contains 188 beds (12 of which are for Venereal Diseases in a separate building). There is also an Out-patient Venereal Diseases Clinic. There is a Pathological Laboratory, Special Departments for X ray and Finsen light, an Out-patient Orthopædic Clinic under the Ministry of Pensions, also a civil Orthopædic Department. Pensioners are also received as in-patients. The Hospital is a centre for the treatment of Tropical Diseases.

ROYAL HOSPITAL, Portsmouth (founded 1847).—The number of beds is 160. The hospital has X Ray and Massage Departments. The hospital is a preparatory School of Medicine and Surgery; the attendance of pupils at this hospital is recognised by the Examining Boards. Particulars of the Secretary at the hospital.

ROYAL BERKSHIRE HOSPITAL, Reading.—This hospital, which contains 220 beds, has been recently enlarged, the additions including a new Out-patient Department, a Casualty Department, an X Ray Department, Electro-Therapeutic and Massage Department, a Laboratory, an Eye Theatre, and Eye Wards.

SALISBURY GENERAL INFIRMARY, Salisbury.—This hospital contains 145 beds. In-patients, 123 daily average; out-patients, 620, including ophthalmic cases 253 and X ray cases 619; attendances on 5903 casuals. Secretary: Mr. S. B. Smith.

ROYAL SALOP INFIRMARY, Shrewsbury.—This hospital has 160 beds. In-patients, 1387; out-patients, 1521; out-patients' attendances for the year, 17,613. A site has been purchased adjoining the present Infirmary structure, and it is proposed to erect an annexe for children thereon. Secretary: Mr. Alfred Sugden.

ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL, Southampton.—This hospital contains 130 beds. In-patients, 2112; out-patients, 9602. Secretary: Mr. T. A. Fisher Hall.

STAFFORDSHIRE GENERAL INFIRMARY, Stafford.—This hospital has 87 beds. In-patients, 828; out-patients, 2269. Secretary: Lieutenant A. E. Collins.

ROYAL HANTS COUNTY HOSPITAL, Winchester.—This hospital has 160 civilian beds. Secretary: Mr. Herbert Maslen.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL, Wolverhampton.—There are 210 beds. Special departments for Children, Gynæcology, Ear, Throat, and Nose Diseases, Electro-therapeutic and X ray, Venereal Disease, and Pathological departments. There is an excellent library. The resident officers are a resident medical officer and three house surgeons. Pupils are allowed to witness the whole of the practice of the hospital and to be present at operations and have every opportunity of acquiring a practical knowledge of their profession. A course of Practical Pharmacy is given by the dispenser. Fees on application. Applications should be made to the Secretary of the Medical Committee.

WORCESTER GENERAL INFIRMARY, Worcester.—This hospital has 132 beds (temporarily reduced to 70). Pupils are taken by members of the Honorary Medical and Surgical Staff. Number of operations last year 893. New X Ray and Electrical Departments have been erected and are now in use. Additional accommodation for the Honorary Staff and Out-patients and also an Outdoor Shelter in connexion with the Children's Ward have been built as a memorial to King Edward VII. In-patients, 900; out-patients, 2980. Secretary: Mr. E. J. Holland.

YORK COUNTY HOSPITAL, York.—This hospital contains 186 beds. There are balconies for outdoor treatment and two installations of X Ray apparatus. A Venereal Diseases Clinic is held.

SCHOOL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The subjects of the Qualifying examination of the Pharmaceutical Society are:—Part 1: (*a*) Chemistry; (*b*) Physics; (*c*) Botany. Part 2: (*a*) Materia Medica; (*b*) Pharmacy, including Posology and the Translation and Dispensing of Prescriptions; (*c*) The law relating to the keeping, selling, and dispensing of poisons and poisonous substances. Fee, 12 guineas; for each subsequent examination after failure, 3 guineas. The advanced or Major examination (for registration as "pharmaceutical chemist") includes botany, chemistry and physics, practical chemistry, and materia medica. Fee, 3 guineas. The inaugural address will be delivered on Wednesday, Oct. 6th. Medical students are admitted to the lectures and laboratory work in any or all the courses. Certificates of instruction in this school are received by the Conjoint Board of the Royal Colleges and by the University of London. As we announced in our issue of August 21st, p. 425, courses are now instituted in technical schools to prepare students for the examinations of the Pharmaceutical Society. Application for admission to the school, or for further information, may be made to the Dean, Professor Greenish, 17, Bloomsbury-square, London, W.C.1.

II.—SCOTLAND.

THE UNIVERSITIES.

UNIVERSITY OF EDINBURGH.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). The degree of Bachelor of Surgery cannot be conferred on any person who does not at the same time obtain the degree of Bachelor of Medicine, and similarly the degree of Bachelor of Medicine is not conferred on any person who does not at the same time obtain the degree of Bachelor of Surgery.

No one is admitted to the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* who has not been engaged in Medical and Surgical study for five years. No course of lectures will be allowed to qualify unless the lecturer certifies that it has embraced at least 100 lectures, or 50 lectures, as may be required by the regulations, and that the student has also duly performed the work of the class.

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended Clinical Surgery during a course or courses extending over not less than nine months, and courses of instruction in all the subsidiary subjects. They must have personally conducted, under the superintendence of a registered medical practitioner, 20 cases of labour at least.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations have effect:—Two of the five years of medical study must be spent in the University of Edinburgh. The

remaining three years may be spent in any University of the United Kingdom, or in any Indian, Colonial, or Foreign university recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Of the subjects of study—viz., Anatomy, Practical Anatomy, Chemistry, Practical Chemistry, Materia Medica, Physiology, Practical Physiology, Practice of Medicine, Surgery, Midwifery and Diseases of Women, Pathology, Practical Pathology, Physics, Botany, Zoology, Medical Jurisprudence, and Public Health—not less than one-half must be taken in the University of Edinburgh, which corresponds to the two years above referred to.

Women are admitted to graduation in medicine under practically the same conditions as men.

The fee to be paid for the degrees of Bachelor of Medicine and Bachelor of Surgery is £23 2*s.*, and the proportion of this sum to be paid by a candidate at each division of the examination shall be as follows—viz.: For the First Division of the Examination (Botany, Zoology, Physics, and Chemistry), £6 6*s.*; for the Second Division (Anatomy and Physiology), £5 5*s.*; for the Third Division (Pathology and Materia Medica and Therapeutics), £4 4*s.*; and for the Final Division (Surgery and Clinical Surgery, Medicine and Clinical Medicine, Midwifery, Clinical Gynæcology, and Forensic Medicine and Public Health), £7 7*s.*

Bachelors of Medicine and *Bachelors of Surgery* may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice other than practice restricted to surgery. In each case an examination must be passed and a thesis submitted for approval of the Faculty. The fee to be paid for the degree of M.D. is £15 15*s.*, and the fee to be paid for the degree of Ch.M. is £15 15*s.*

A diploma in Tropical Medicine and Hygiene (D.T.M. and H.) is granted to graduates in Medicine and Surgery of the University of not less than six months' standing, and to Registered Medical Practitioners who, having resided in a tropical country, may be approved by the Senatus, on the recommendation of the Faculty of Medicine.

Diploma in Psychiatry.—Courses of instruction have also been instituted for a Diploma in Psychiatry, open to all legally qualified Medical Practitioners who conform with the Regulations. There shall be two examinations for the Diploma, the first comprising the subjects of Anatomy of the Nervous System; Physiology, Histology, and Chemistry of the Nervous System; Pathology of the Brain and Nervous System; Psychology, Lectures, and Demonstrations; and the second examination comprising the subjects of Clinical Psychiatry, Clinical Neurology, Experimental Psychology, Advanced Course in one of the subjects of Part I. (including Advanced Bacteriology). The fee for each examination shall be £6 6*s.*

Diploma in Public Health (D. P. H. Univ. Edin.).—Courses of instruction have been instituted for a Diploma in Public Health. There are two examinations, the fee for each being £6 6*s.*

The University of Edinburgh is especially rich in scholarships and prizes in medical subjects. Full particulars can be obtained from the Dean of the Medical Faculty.

SCHOOL OF MEDICINE OF THE ROYAL COLLEGES, Edinburgh.—The number of students varies much in the classes and subjects. It is within the limit to say that before the war about 1000 students availed themselves each session of the opportunity of attending the school. The lectures qualify for the University of Edinburgh and other Universities, the Royal Colleges of Physicians and Surgeons of London, Edinburgh, and Dublin, the Faculty of Physicians and Surgeons of Glasgow, and other Medical and Surgical and Public Boards.

The practical classes and laboratories will open and the lectures commence on Oct. 6th.

In accordance with the statutes of the University of Edinburgh one-half of the qualifying classes required for graduation may be attended in this school. The regulations require that the fee for any class taken for graduation in Edinburgh shall be the same as that for the corresponding class in the University. The whole education required for graduation at the University of London may be taken in this school.

Special courses of instruction for dental students are also included in the curriculum of this school.

The minimum cost of the education in this School of Medicine for the Triple Qualification of Physician and Surgeon from the Royal Colleges of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, including the fees for the Joint Examinations, is about £130, payment of which is distributed over the period of study. There is no composition fee.

Further particulars regarding the school, also its calendar, may be had on application to the Dean of the School, 11, Bristo-place, Edinburgh.

Clinical Instruction.—ROYAL INFIRMARY, Edinburgh.—This hospital has 921 beds and 42 cots for children. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There are also large and complete Medico-Electrical and X Ray and Bathing Departments. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology. The fees for hospital attendance are as follows—viz.: Perpetual ticket, in one payment, £12; annual ticket, £6 6*s.*; six months, £4 4*s.*; three months, £2 2*s.*; monthly, £1 1*s.* Separate payments amounting to £12 12*s.* entitle the student to a life ticket. No fees are paid for any medical or surgical appointment. The appointments are as follows: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department are appointed by the pathologist.

ROYAL HOSPITAL FOR SICK CHILDREN, Sciennes-road, Edinburgh.—This hospital contains 120 beds, and is fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily in a building adjoining the hospital. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given from time to time throughout the year by the staff. Students may enter at any time. Full particulars can be obtained from the Registrar at the hospital.

EYE, EAR, AND THROAT INFIRMARY OF EDINBURGH, 6, Cambridge-street, Lothian-road.—Clinical Lectures and Instruction are given in this institution, which is open at 1 o'clock daily for outdoor patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for outdoor Ear, Nose, and Throat Patients. Special Practical Ophthalmoscopic Classes by arrangement. Patients whose diseases require operations or more than ordinary care are accommodated in the house. Secretary: Mr. J. P. Watson, W.S., 32, Charlotte-square.

Post-Graduate Instruction.—In connexion with the University and Royal Colleges short advanced courses for Graduates will be held during the Summer and Autumn Terms and the Summer Vacation provided a certain minimum number of Graduates enter for them, and, in certain courses, a maximum limit will also be imposed. The courses will be conducted by teams of teachers, and the following subjects will be included: Clinical Therapeutics, Tuberculosis, Diseases of the Blood, Diseases of the Renal System, Diseases of the Alimentary System, Diseases of the Circulatory System, Diseases of the Ductless Glands, Abdominal Surgery, Genito-Urinary Surgery, Surgery of Children, Clinical Gynæcology and Clinical Obstetrics,

Child Welfare, Diseases of the Larynx, Ear, and Nose, Ophthalmoscopy and Errors of Refraction, Venereal Diseases, Advanced Bacteriology, Advanced Medical Anatomy, Advanced Surgical Anatomy. Arrangements will also be made, if necessary, for special instruction in Antenatal Maternity Work, Psychiatry, and Dermatology. Particulars in regard to the courses—dates of commencement, fees, &c.—may be had on application to the Honorary Secretary, Post-Graduate Courses in Medicine, University New Buildings, Edinburgh.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Six degrees, open both to men and women, are conferred: M.B. and Ch.B. (always conjointly), M.D. and Ch.M.; B.Sc. in Public Health; D.Sc. in Public Health; and B.Sc. in Pharmacy. A Preliminary Examination must be passed in (1) English, (2) Latin, (3) Elementary Mathematics, and (4) Greek, or French, or German, or Italian, with possible options to students whose native language is not English. Candidates taking the University preliminary examination are not obliged to pass in all the four subjects at one examination, but must do so at not more than two occasions.

For the degrees of M.B. and Ch.B. a curriculum of five years is required. The candidate must, during his curriculum, have attended a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), two terms; with Practical Chemistry, one term; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery, two terms; Medicine, two terms. Candidates must attend at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine, and the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have attended a course of Mental Diseases and of Practical Pharmacy (25 meetings), must have been properly instructed in Vaccination at a public vaccination station, and must have attended at least 20 cases of labour and the Practice of a Lying-in Hospital. The University also requires further study in various special subjects.

There are four Professional Examinations, the first comprising Botany, Zoology, Physics, and Chemistry; the second comprising Anatomy and Physiology; the third comprising Materia Medica and Therapeutics and Pathology; and the fourth or final, comprising Medical Jurisprudence and Public Health, Surgery and Clinical Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and the Diseases peculiar to Women and to Infants.

The degrees of M.D. (Doctor of Medicine) and Ch.M. (Master of Surgery) are higher degrees in Medicine and Surgery respectively, and candidates (not under 24 years of age) who have previously obtained the double bachelorship may be admitted to either M.D. or Ch.M. on completing the after course prescribed, including an examination in Clinical Medicine for M.D. and an examination in Surgical Anatomy, operations on the dead body, and Clinical Surgery for Ch.M.

In 1919 new chairs were instituted in Bacteriology, Organic Chemistry, and Physiological Chemistry.

Fees.—The Fees for M.B. and Ch.B. are £23 2*s*. The class fee in each subject of the curriculum for M.B. and Ch.B. is £2 2*s*., £3 3*s*., or £4 4*s*., and the present fee for hospital attendance is £7. The fee for M.D. is £15 15*s*., and for Ch.M. £15 15*s*.

The great majority of the students take their hospital course at the Western Infirmary, or the Royal Infirmary, where clinical instruction is given by professors of the University and others. Clinical instruction on Fevers is given at Ruchill and Belvidere Hospitals, while special courses, largely of a practical nature and embracing work in Hospital or Asylum wards, are conducted by University Lecturers on the Ear, the Throat and Nose, Dermatology, Ophthalmology, Venereal Diseases, Tuberculosis, and Insanity. Queen Margaret College, sometime conducted as a separate institution for the higher education of women, was made over to the University in 1892, and in it medical classes for women are conducted under University professors and other lecturers appointed by the University Court, whilst for clinical instruction female students mostly attend the Royal Infirmary.

In this University Bursaries and Prizes to the annual amount of over £1000 are appropriated to students in the Medical Faculty, and there are also several Scholarships and Fellowships which may be held by medical students who have gone through the Arts course. A full list will be found in the University Calendar.

THE ANDERSON COLLEGE OF MEDICINE, Dumbarton-road, Glasgow, W.—Courses are given which qualify for all the licensing boards and for the Universities of London, Durham, Edinburgh, and Glasgow (the latter two under certain conditions). Candidates for the Licence in Dental Surgery can obtain the full medical curriculum in Anatomy, Chemistry, Physiology, Surgery, Practice of Medicine, and Materia Medica. The courses special to Dentistry are also conducted in the Anderson College of Medicine.

The buildings are situated in Dumbarton-road, immediately to the west of the entrance to the Western Infirmary, and adjoining the University. Extensive accommodation is provided for Practical Anatomy, Practical Chemistry, Practical Botany, Practical Zoology, Practical Physiology, Practical Pharmacy, Operative Surgery, and Public Health. Ample provision has also been made for the comfort of students.

Women students are admitted on the same terms as men.

The Carnegie Trust extends its benefactions to students of the Anderson College of Medicine. Full particulars may be obtained from Sir W. S. McCormick, the Carnegie Trust Offices, Merchants' Hall, Edinburgh.

Communications relating to the College to be addressed to the Secretary of the Medical Faculty, The Anderson College of Medicine, Glasgow, W. Communications relating to the Preliminary Examination in General Education to be addressed to Mr. Hugh Cameron, M.A., F.E.I.S., Educational Institute Office, 34, North Bridge-street, Edinburgh. Communications relating to the Triple Qualification to be addressed to Mr. Walter Hurst, Royal Faculty Hall, 242, St. Vincent-street, Glasgow.

The Winter Session will open on Friday, Oct. 15th, 1920.

ST. MUNGO'S COLLEGE AND GLASGOW ROYAL INFIRMARY.—The classes in St. Mungo's College qualify for the English, Scotch, and Irish Conjoint Boards and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust as regards Scottish birth or extraction, age (16 years), and Preliminary Examination, are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College. The classes are open to male and female students equally. The minimum fees for all the lectures, including hospital attendance, necessary for candidates for the Diplomas of the English or Scotch Colleges of Physicians and Surgeons, amount to £100. Further particulars can be obtained from a syllabus which may be procured free on application to the Secretary of the Medical Faculty, 86, Castle-street, Glasgow.

QUEEN MARGARET COLLEGE (Women's Department of the University).—This is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curriculum, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. They have access to the University Museum and can borrow books from the University Library, besides having a library of reference in Queen Margaret College. The School of Medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. In July, 1894, for the first time in the history of any Scottish University, women students graduated in medicine in Glasgow University. Over 300 women have now taken the degree of M.B., C.M., or M.B., Ch.B. of the University of Glasgow and 24 the degree of M.D. The women students attend classes in the various University Buildings at Gilmore-hill, Queen Margaret College, the Royal Infirmary, and the Western Infirmary. Excellent facilities for clinical work are given in the Royal and Western Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine; and by an ordinance of the Universities Commissioners women are admitted to certain University bursaries, scholarships, and fellowships. The Winter Session will open on Oct. 18th, but owing to the pressure upon accommodation in classes no new students of Medicine are to be admitted until April, 1921. Applications for entrance at that date should be made before Feb. 1st, 1921.

ROYAL INFIRMARY, Glasgow.—The ancient connexion between the University of Glasgow and the Royal Infirmary was revived in 1911, when four University Chairs and several University Lectureships were established at the infirmary. St. Mungo's College is situated in the infirmary grounds. The infirmary has, including the Ophthalmic Department, 700 beds. There are special beds and wards for diseases of women, of the throat, nose, and ear, skin, venereal diseases, burns and septic cases. The wards are open to Women Students. At the Out-door Department the attendances in 1919 numbered about 146,000. In addition to the large medical and surgical departments there are departments for special diseases—viz., diseases of women, of the throat and nose, of the ear, of the eye, of the skin, and of the teeth. Five house physicians and 12 house surgeons, who board in the hospital free of charge, are appointed every six months. Clerks and dressers are appointed by the physicians and surgeons. As a large number of cases of acute diseases and accidents of a varied character are received these appointments are very valuable and desirable. There is a modern and fully equipped Electrical Pavilion, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. The fees are as follows: (*a*) For hospital practice, including attendance at the out-door department, at the pathological department, post-mortem examinations, and the use of the museum: Perpetual ticket, £7; six months, £2 2*s*.; three months, £1 1*s*.; separate payments amounting to £7 7*s*. entitle the student to a perpetual ticket, on return of previous season tickets; (*b*) for Clinical Lectures, six months, £3 10*s*.; three months, £1 15*s*.; (*c*) Vaccination, £1 1*s*.; Pathology, £4 4*s*.; Bacteriology, £2 2*s*.

Post-graduate classes will be held during September in Clinical Medicine, Clinical Surgery, Clinical Gynæcology, Surgical Diagnosis, Urology, Auto-intoxications, Clinical Examination of Urine, Hæmatology, Diseases of the Skin, Venereal Disease, Diseases of Throat, Nose and Ear, and Electro-therapeutics, X Ray Therapy, and Diagnosis. The fee for attendance at each of these courses is £1 1*s*.; for any three of them, £2 2*s*. A Special Course on Diseases of the Eye will be held in the Ophthalmic Institution. Fee for this course £2 2*s*. Those desirous of joining any of these classes should communicate at once with Dr. J. Maxtone Thom, Superintendent.

GLASGOW WESTERN INFIRMARY.—This hospital adjoins the University of Glasgow. Number of beds upwards of 600. Special wards are set apart for Diseases of Women, Throat, Nose, and Ear, and for Affections of the Skin. In the out-patient department there are special cliniques for Diseases of Women and for Diseases of the Throat, Ear, Teeth, Skin, Venereal Disease, and Electro-therapeutics. The Clinical Courses are given by the physicians and surgeons, each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. All the courses of clinical instruction are recognised by the University of Glasgow and the other boards in the kingdom. In the Pathological Department the course is both systematic and practical, also post-graduate courses, and extends through the winter and following summer; these are likewise recognised by the University for graduation. Eighteen resident assistants are appointed annually, without salary, from those who have completed their course. The fee for hospital attendance is £7, and the fees for clinical instruction are £3 3*s*. for the Winter Session and £2 2*s*. for the Summer Session. A Clinical Laboratory has been opened, and students receive laboratory instruction from the lecturer on clinical methods. Secretary: J. Matheson Johnston, C.A., 87, Union-street

A School of Massage, Medical Electricity, and Swedish Remedial Exercises has been established to qualify for the Certificate of the Chartered Society of Massage and Medical Gymnastics.

ROYAL HOSPITAL FOR SICK CHILDREN, Yorkhill, Glasgow.—This institution, which was founded in 1882, consists of: (1) a hospital at Yorkhill containing 250 cots built on an elevated and central site close to the University and opened in July, 1914; (2) a Dispensary, or Out-patient Department, in West Graham-street, opened in October, 1888; and (3) a country branch at Drumchapel, Dumbartonshire, containing 30 cots, opened in 1903. Children treated must not be over 12 years of age and suffering from non-infectious diseases. In the hospital about 5000 children are treated annually. In the Out-patient Department over 12,000 are treated annually, involving nearly 50,000 attendances. There are two lectureships in the University of Glasgow in connexion with the hospital, one on the Medical Diseases of Infancy and Childhood, and the other on Surgery and Orthopædics in Relation to Infancy and Childhood. These lectureships are held by the Visiting Physician, Dr. Leonard Findlay, and the Visiting Surgeon, Mr. Alexander MacLennan. The lectures are both systematic and clinical, but particularly and chiefly the latter. Information with regard to clinical instruction, lectures, demonstrations, post-graduate study, &c., may be obtained from the Medical Superintendent.

GLASGOW ROYAL MATERNITY AND WOMEN'S HOSPITAL, Rottenrow.—The new hospital, which was opened in 1908, is in point of size the largest of its kind in Britain and has accommodation for 108 patients. A Maternity and Child Welfare Centre has been established in connexion with the hospital, consisting of a complete In-door and Out-door Ante-natal Department and an Infant Consultation Clinic. In 1919 2636 normal cases and 2316 abnormal cases were treated by the hospital in the In-door and Out door Departments. Secretary: Mr. William Guy, 146, Buchanan-street. Full particulars as to fees and accommodation may be obtained from the House Superintendent at the Hospital.

ROYAL SAMARITAN HOSPITAL FOR WOMEN, GLASGOW.—This hospital, founded in 1886, is one of the largest purely gynæcological hospitals in Great Britain, possessing, as it does, over 90 beds. It offers excellent facilities for clinical instruction in the diseases peculiar to women, treating in the wards and in the out-patient department some 4000 cases per annum. The surgeons, four in number, visit the wards in the mornings. For further information application may be made at the Hospital, or to Thos. Macquaker, honorary secretary, 89, West Regent-street, Glasgow.

GLASGOW LOCK HOSPITAL, 41, Rottenrow.—The Hospital contains 83 beds. During 1919 364 patients were admitted to the wards; 14,187 visits were made by out-door patients at the Dispensary. Classes are held for the clinical instruction of medical students and practitioners. J. Neilson Gray, secretary and treasurer, 65, Bath-street, Glasgow.

GLASGOW OPHTHALMIC INSTITUTION, 126, West Regent-street (29 beds and six cots).—Clinical and systematic course of lectures for students during the winter and summer

sessions. In-patients, 879; out- or dispensary patients, 13,918; total attendances, 34,031. Operations on Wednesdays and Saturdays. This institution is the Ophthalmic Department of the Royal Infirmary. Clinical instruction is given during both summer and winter sessions to men and women students attending the University. During September post-graduate courses will be held in connexion with the Glasgow Royal Infirmary. Secretary and Cashier: R. Morrison Smith, C.A., 135, Buchanan-street, Glasgow.

GLASGOW EYE INFIRMARY, Berkeley-street and Charlotte-street.—This institution, the largest of its kind in Scotland, was founded in 1824. The average number of new patients for the last ten years has been 27,106 and the total number of cases in 1919 was 25,462. The wards and dispensary are recognised by the University of Glasgow for the purpose of instruction in ophthalmology for graduation in medicine. A Venereal Centre is being established. Secretary and Acting Treasurer: Harold John Black, 88, West Regent-street, Glasgow. The medical session opens in October. A Post-graduate Class will be held.

GLASGOW HOSPITAL FOR DISEASES OF THE EAR, NOSE, AND THROAT, 27 and 28, Elmbank-crescent.—12 beds and three cots. New patients, 5508. Attendances at out-patient department 19,023. Admitted to in-door department 392. Clinical instruction is given in connexion with Dr. Connal's course on Diseases of the Ear at Anderson's College and Dr. Syme's course on Diseases of the Throat and Nose at the Western Medical School. A course of post-graduate study has been conducted by the staff of the hospital. Secretary: Mr. P. T. Young.

UNIVERSITY OF ST. ANDREWS (UNITED COLLEGE ST. ANDREWS AND UNIVERSITY COLLEGE, DUNDEE).

Four degrees in Medicine and Surgery are conferred by the University of St. Andrews—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), a Diploma in Public Health, and Diploma in Dental Surgery (L.D.S.). The whole curriculum may be taken at University College, Dundee, or the first two years of the course may be taken at St. Andrews and the remaining three years in Dundee. The degrees of M.B. and Ch.B. shall always be conjoined. Before commencing his medical studies each student shall pass a Preliminary Examination in (*a*) English, (*b*) Latin, (*c*) Elementary Mathematics, and (*d*) one of the following optional subjects: (α) Greek, (β) French, (γ) German, (δ) Italian, (ε) any other approved Modern Language. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities shall exempt from the Preliminary Examination. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science and the Final Examination for the Diploma of LL.A.

Degree of Bachelor of Medicine and Bachelor of Surgery.—Candidates must have been engaged in medical study for at least five years. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or, alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, including such examinations as may be prescribed in the various classes—viz.: Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, or Institutes of Medicine, Practice of Medicine, Surgery, Midwifery and the Diseases peculiar to Women and Infants, Pathology, Practical Chemistry, Physics (including the Dynamics of Solids, Liquids, and Gases, and the Rudiments of Sound, Heat, Light, and Electricity), Elementary Botany, Elementary Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons and is recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, Children's Diseases, Fevers, Ophthalmology, Diseases of the Ear, Throat, and Nose, Anæsthetics, and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations shall have effect:—1. Two of the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine, subject to certain provisions.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica and Pathology and Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynæcology (Systematic and Clinical).

The fee to be paid for the degrees of Bachelor of Medicine and Bachelor of Surgery shall be 22 guineas, and the proportion of this sum to be paid by a candidate at each division of the examination shall be regulated from time to time by the University Court. The fee to be paid for the degree of Doctor of Medicine shall be 15 guineas, and for the degree of Master of Surgery 15 guineas. The whole medical curriculum can be taken in University College, Dundee, or the first two years in United College, St Andrews.

For further particulars and details as to scholarships and bursaries application should be made to Professor Kynoch, Dean of the Medical Faculty, University College, Dundee.

UNIVERSITY COLLEGE, Dundee.—This College is one of the constituent colleges of the University of St. Andrews. In the medical buildings there are spacious and well-equipped laboratories. The complete medical curriculum can be taken in Dundee. For classes, fees, &c., see under University of St. Andrews.

ROYAL INFIRMARY, Dundee.—The Infirmary contains 408 beds, including special wards for the Diseases of Women, Children, Eye, Ear, and Throat, Skin, and for Obstetric cases. There is in addition an Extern Obstetric Department. There were during last year 17,118 out-patients and 834 home (maternity) patients. The Royal Infirmary offers facilities for practical work to students. Appointments: Six qualified Resident Medical Officers (Male or Female) are appointed every six months and one Obstetric Assistant. Clinical Clerks and Dressers are attached to the Physicians and Surgeons, and students are appointed as assistants in the Pathological Department. There are in connexion with the clinical courses Tutorial Classes in Medicine and Surgery. Instruction is also given in Practical Pharmacy and Materia Medica. Further information can be obtained from the Medical Superintendent.

UNIVERSITY OF ABERDEEN.

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Medicine (M.B.), and Bachelor of Surgery (Ch.B.).

Degrees of M.B. and Ch.B.—Before commencing his medical studies each student must pass a Preliminary Examination in (1) English, (2) Latin, (3) Mathematics, and (4) one additional language—Greek, French, German, Italian, or such other language as the Senatus may approve.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Botany, Zoology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Medical Jurisprudence, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital; they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem examinations, Venereal Diseases, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

The fee for the degrees of M.B. and Ch.B. amounts to £23 2*s*.

Besides the Royal Infirmary, students have the opportunity of attending the following institutions: City Fever Hospital, Sick Children's Hospital, General Dispensary, and Lying-in and Vaccine Institutions, Royal Lunatic Asylum, Ophthalmic Institution, &c.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A thesis has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

A diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Application for further information should be addressed to the Secretary of the Medical Faculty.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 15 Bursaries (competition and presentation) are open each year, of £15 to £30 per annum in value, most of them being tenable for three years. Scholarships: five Post-Graduate Scholarships, value £36 to £160 per annum. Prizes and Medals: 13 Gold Medals and Prizes for proficiency in special departments, &c.

Clinical Instruction is given in the Aberdeen Royal Infirmary (270 beds) by the physicians and surgeons on the staff.

ABERDEEN ROYAL ASYLUM.—Contains, with hospital attached to main institution and agricultural branch, about 950 beds. Clinical instruction is given to students during three months in summer. Clerk and Treasurer, Mr. A. Scott Finnie, 343, Union-street, Aberdeen.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

These Colleges have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three Bodies.

The three Bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery. Copies of the Regulations for the Single Licence of any of the Bodies may be had on application to the respective secretaries.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, three months; Elementary Biology, three months; Chemistry, six months; Practical or Analytical Chemistry, three months; Anatomy, during at least six months; Practical Anatomy, twelve months; Physiology, six months; Practical Physiology, three months; Materia Medica, three months; Pathology (including Practical Pathology), nine months; Practice of Medicine, six months; Clinical Medicine, nine months; Principles and Practice of Surgery, six months; Clinical Surgery, nine months; Midwifery, three months; Gynæcology, one course of not less than 13 meetings; Diseases of Children, one course of not less than 13 meetings; Medical Jurisprudence and Public Health, three months. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser. He must also attend for two and a half months instruction in Practical Pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of a class of Practical Pharmacy.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than six months in the wards in each case, and receive practical instruction in administration of anæsthetics. He must attend for six months the practice of a public dispensary especially recognised by any of the above authorities, or the out-patient practice of a recognised general hospital or act for six months as pupil to a registered practitioner who either holds such a public appointment, or has such opportunities of imparting practical knowledge as shall be satisfactory to the coöperating authorities; this attendance should be made after the student has passed the First and Second examinations.

Candidates are also required to attend the following courses: Diseases and Injuries of the Eye, three months; Insanity, three months; Infectious Diseases, three months; Gynæcology, three months; Diseases of Children, three months.

The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Physics, Chemistry, and Elementary Biology.

Second Examination includes Anatomy and Physiology and Histology; and candidates may be admitted to this examination at the end of the second year of medical study.

Third Examination includes Pathology and Materia Medica with Pharmacology.

Final Examination.—The Final examination shall not be taken earlier than the end of the fifth year of study and shall embrace the following subjects:—Medicine, including Therapeutics, Medical Anatomy, and Clinical Medicine; Surgery, including Surgical Anatomy, Clinical Surgery, and Diseases and Injuries of the Eye; Midwifery and Diseases of Women; and, if not passed previously, Medical Jurisprudence and Public Health, but it is optional to candidates who have passed the Third Examination to be admitted to the subject of Medical Jurisprudence and Public Health on lodging certificates of having attended the necessary course in that subject at any time; but the subjects of Medicine, Surgery, and Midwifery shall be taken together at any time after the end of the fifth Winter Session, provided that a period of 24 months has elapsed since passing the Second Examination. All candidates shall be subjected, in addition to the written and oral examinations, to clinical examinations in Medicine and Surgery, which shall include the Examination of Patients, Physical Diagnosis, the Clinical use of the Microscope, Examination of the Urine and Urinary Deposits, Surgical Appliances, Bandages, Surface Markings, &c. The fees payable for the Final Examination shall be—for the whole examination, £15, for re-entry after rejection, £5, and for the subjects of Medical Jurisprudence and Public Health when taken separately, £5, with £3 for re-entry in that subject.

There are four periods of examination annually: During the ensuing period, three in Edinburgh and one in

Glasgow, in 1920–21. The Registrar in Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and the Registrar in Glasgow, Mr. Walter Hurst, 242, St. Vincent-street, to whom fees and certificates must be sent for the respective examinations, and from whom further particulars concerning fees can be obtained.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH: THE MEMBERSHIP AND FELLOWSHIP.

In addition to the diplomas granted by the Scottish Conjoint Board the Royal College of Physicians grants its Single Licence to candidates already possessing legal qualifications for professional practice.

The Royal College of Physicians of Edinburgh grants a *Membership* and a *Fellowship*.

Membership.—A candidate, who must be a Licentiate of a British or Irish College of Physicians, or a graduate in medicine of a University, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychology, public health, obstetrics, gynæcology, diseases of children, tropical medicine, or medical jurisprudence. The fee for the Membership is £36 15*s.*, 15 guineas of which will be returned to any successful candidate who was already a Licentiate of the College at the time of qualifying for the Membership.

Fellowship.—The Fellows are selected from the ranks of the *Members*. The fee is £64 18*s.*

ROYAL COLLEGE OF SURGEONS OF EDINBURGH: THE FELLOWSHIP.

The Royal College of Surgeons of Edinburgh also admits to the examination for its Single Licence any candidates who hold a Diploma in Medicine of any British, Indian, or Foreign university or of any British College of Physicians, or of the Society of Apothecaries of London or Apothecaries' Hall, Dublin, granted under the provisions of the Medical Act, 1886, whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or to those who have passed a full examination for any of the above. Female practitioners are admitted to the Licence of the College and now to the Fellowship, and the regulations apply to practitioners of either sex.

The Royal College of Surgeons of Edinburgh grants a diploma of Fellowship after examination to the holders of the surgical degrees of diplomas of such British examining bodies, as well as of the holders of such surgical degrees of the Universities of Canada, Australia, New Zealand, and the Indian Empire as are recognised by the College.

The Fellowship.—Candidates for the examination must be 25 years of age and must have been engaged in practice for at least two years. The examination is of a practical nature, partly written and partly *viva voce*, and must include surgery and surgical anatomy, operative surgery, and clinical practice. One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine. The fee to be paid on entering for examination for Fellowship is £45, £10 of which is remitted to those who already hold the Licentiateship of the College. Candidates rejected at the examination obtain repayment of fee less £10 retained for examination expenses. One month's notice of intention to appear for examination must be given by the candidate to Mr. D. L. Eadie, 49, Lauriston-place, Edinburgh, clerk to the College, together with credentials signed by two Fellows of the College, one of whom must be a resident in Edinburgh, otherwise a special application, with six testimonials, must be made to the President and the Council of the College.

THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

Like the preceding corporations, the Royal Faculty of Physicians and Surgeons of Glasgow grants a Fellowship and a Licence to be held as separate qualifications.

Fellowship.—The Fellowship of the Faculty is granted after examination in medicine or surgery, together with an optional subject, which may be anatomy or physiology or be selected from any special branch of medicine or surgery. 14 days' notice must be given by the candidate of his intention to present himself to Mr. Walter Hurst, the Faculty Hall, 242, St. Vincent-street, Glasgow. The fee for the Fellowship is £30, £10 of which sum are returned to any successful candidate who already holds the Licence of the Faculty. An additional sum of £20 is required in the case of candidates resident within seven miles of Glasgow. In certain circumstances Fellows may be elected as a mark of distinction.

Licence.—The Licence of the Royal Faculty is granted as a separate qualification to qualified practitioners in Medicine after examination in surgery, including surgical anatomy and clinical surgery. The fee is 15 guineas.

SCOTTISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

The hospitals which are recognised by the Scottish Conjoint Board, as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities. In addition the Scottish Boards recognise all the places which are recognised by the English Conjoint Board (see p. 451) and the Irish Conjoint Board (see p. 463).

III.—IRELAND.*

THE UNIVERSITIES.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC).

Matriculation.—In order to join the School of Physic students pass a matriculation examination. University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary; Extern Students, any examination recognised by the General Medical Council. The winter courses begin on Oct. 1st.

Degrees in Medicine (M.B.), Surgery (B.Ch.), and Midwifery (B.A.O.).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of matriculation. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended:—(1) Lectures—Botany, Zoology, Physics and Practical Physics, Systematic, Descriptive and Applied Anatomy, Chemistry and Practical Chemistry, Histology, Physiology and Practical Physiology, Practice of Medicine, Midwifery, Pathology, Materia Medica and Therapeutics, Medical Jurisprudence and Hygiene, Surgery and Operative Surgery; (2) three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital; (3) Practical Vaccination, one month's instruction; (4) Mental Disease, three months; (5) Practical Midwifery with Clinical Lectures, including not less than 20 personally conducted cases, six months; (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. The Intermediate Medical, Part I. including Anatomy and Physiology, and Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica, Hygiene and Jurisprudence, and Pathology; and Part II., Medicine, including Clinical, Surgery, Midwifery, Gynæcology, Mental Diseases, Operations, and Clinical Ophthalmology. Part I. may be passed in the fourth year and Part II. completed at the end of the fifth year.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A. of three years' standing. He must also read and discuss a thesis before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not

* The conditions in Ireland have probably interfered with postal arrangements, and from some of the Irish institutions we have been unable to get replies. These institutions are marked with an asterisk.

less than three years' standing, and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study, or study and practice, of his profession. He must then pass a special examination.

Master in Obstetric Science.—A Master in Obstetric Science must be a Bachelor of two years' standing and produce evidence of having been engaged in the study of Obstetric Medicine and Surgery during two years. He is then required to pass a special examination.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at the Rotunda Hospital, a six months' course in Trinity College, and then pass a special examination.

Bachelor in Dental Science and Master in Dental Science.—The regulations under which these degrees are awarded can be obtained by application to the Registrar of the School of Physic.

All Degrees and Courses of Instruction are open to women students.

Clinical instruction.—The hospital facilities for clinical instruction available in Dublin will be described below.

THE NATIONAL UNIVERSITY OF IRELAND.

Matriculation.—All students intending to proceed to the medical degree of the University of Ireland must pass a matriculation examination, the examination taking place in June and September in Dublin and at certain local centres. All students must pass in five subjects (three of which must be Irish, English, and mathematics). All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination:—1. Irish. 2. Latin or Greek. 3. French, German, Italian, Spanish, Portuguese, Welsh, or any other modern language approved by the Senate. 4. English. 5. Mathematics. 6. Latin, Greek, French, German, Welsh, Spanish, Italian, Portuguese, or any other modern language approved by the Senate, History and Geography (*as a composite subject*), Natural Philosophy, or Physics as an alternative, Chemistry, Botany, and for women candidates only, Physiology and Hygiene. Candidates who under the regulations are exempted from the necessity of presenting Irish as one of their subjects may present as their fifth subject either a second language or a second science subject. Students entering for degrees in Medicine or Dentistry, if already registered by the General Medical Council, may be accepted as matriculated students of the Faculty of Medicine on passing the matriculation examination in any faculty of the University.

The medical degrees granted are:—

M.B., B.Ch., and B.A.O.; and M.D., M.Ch., and M.A.O.—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

UNIVERSITY COLLEGE, DUBLIN.—The University and the College were created by the Irish University Act, 1908, and by Charters issued in December, 1908. Former students of the Cecilia-street School of Medicine who graduated in the Royal University may become graduate members of the new College. The constitution of the College, like that of the Constituent Colleges of Cork and Galway, provides for a governing body, an academic council consisting of professors and coöpted lecturers, a body of graduate members, and a body of student members matriculated in the University. The first professors and lecturers were appointed by the Dublin Commissioners Irish Universities Act, 1908.

Matriculation.—Almost all the students of the College are matriculated students of the National University of Ireland.

University Examinations in Medicine.—The First Examination includes Physics, Chemistry, Botany, and Zoology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination includes Pathology, Medical Jurisprudence and Hygiene, and Materia Medica.

Degrees of M.B., B.Ch., and B.A.O.—The Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year when the curriculum has been completed. The course of study is as follows:—First year.—Winter: Anatomy and Practical Anatomy (required for the Second Examination), Chemistry, Practical Chemistry, and Experimental Physics (with Laboratory Course). Summer: Zoology, Practical Zoology, Botany, and Practical Botany. Second year.—Winter: Anatomy, Practical Anatomy, Physiology, and Practical Physiology (physical and chemical). Summer: Anatomy, Practical Anatomy, Physiology, and Practical Histology. Third year.—Winter: Pathology, Surgery or Medicine, Hygiene, Medical Jurisprudence, and Practical Pharmacy. Summer: Materia Medica and Therapeutics, and Practical Pathology. Candidates are also required to attend a General Hospital for nine months (winter and summer). Fourth year, or fourth and fifth years.—Winter: Medicine or Surgery (the subject to be that not taken in the third year), and Midwifery and Gynæcology. Summer: Operative Surgery, Applied Anatomy, and Ophthalmology and Otology. Candidates are also required to attend a General Hospital for nine months (winter and summer), and to take instruction in Vaccination, and three months Fever Hospital. Fifth year.—If the Academic (Collegiate) Courses are taken as above, the Courses of the fifth year will be the following: Hospital Attendance, General Hospital, nine months; Clinical Ophthalmology and Otology, three months; Practical Midwifery and Gynæcology, six months; Mental Diseases, to be attended at a Lunatic Asylum, three months. (*Note.*—Practical Midwifery and Gynæcology may be taken in the fourth year after the Systematic Course of Midwifery, but it must not be taken concurrently with the period of attendance at Fever Hospital.) The degree of M.D. may be obtained either by examination or on published work.

Fees.—The fees for Courses may be obtained on application to the Registrar for the College publications.

Information concerning these, and the numerous scholarships and exhibitions of the College can be obtained from the Dean of the Faculty, Professor E. P. McLoughlin.

UNIVERSITY COLLEGE, CORK: THE SCHOOL OF MEDICINE.—The building is provided with a very large, well-ventilated dissecting room supplied with electric light, with physiological, toxicological, pathological, and pharmaceutical laboratories, materia medica, anatomical and pathological museums, as well as a collection of surgical and obstetrical instruments and appliances. There are well-appointed physical, chemical, and biological laboratories, and a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings. There are Students' Clubs for men and women students of the College and various athletic clubs, the last of these holding a public meeting once in each year in the Mardyke grounds.

All students who have been admitted as matriculated students are required to attend before the President and sign the Roll of Matriculated Students. Students who are candidates for degrees in the National University of Ireland must have passed the Matriculation Examination of that University or other recognised examination, and medical students must have passed a preliminary examination

recognised by the General Medical Council. For information as to the conditions and courses of the Matriculation Examination application may be made to the Registrar, National University, Dublin.

Admission of Medical Students.—Students in the Faculty of Medicine who have passed the First Professional Examination of the Conjoint Examinations of the Royal College of Physicians and the Royal College of Surgeons in Ireland, or of the Royal College of Physicians and Royal College of Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, or of the Royal College of Physicians, London, and Royal College of Surgeons, England, may be admitted to the rank of second-year students on making application to the Council and submitting a certificate of having passed the examination. Similarly, students who have passed the Second Professional Examination of the same Colleges may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may be admitted to the rank of fourth-year students.

Residence of Students.—There is no accommodation for the residence of students within the College, but students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, a list of which can be obtained from the Secretary. All students are required to register their addresses each session in the book kept for that purpose in the hall porter's office, and to notify immediately to the Registrar any change of address during the session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students.

Clinical Instruction.—Students may attend the South Infirmary, Cork North Charitable Infirmary, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, the Cork Maternity, the Cork Fever Hospital, the Cork District Hospital, and the Cork Ear, Eye, and Throat Hospital.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, Professor A. E. Moore.

South Infirmary and County of Cork General Hospital (100 beds).—Clinical instruction is given daily in the wards. Special instruction on Diseases of Women and Children will be given in the special wards for such cases. Fee for nine months, £12 12*s.*; for six months, £8 8*s.*; for three months, £4 4*s.* Two resident pupils will be appointed by competitive examination. Honorary Secretary: Dr. N. I. Townsend.

Cork North Charitable Infirmary and County and City of Cork General Hospital (112 beds).—Clinical instruction is given daily in the wards by the physicians and surgeons. Special instruction is given to Junior Students on two days weekly. Fee for perpetual ticket, £22 1*s.*; for 12 or nine months, £9 9*s.*; for six months, £5 5*s.*; and for three months, £3 3*s.* Two resident pupils are appointed quarterly by the medical staff. All resident pupils are required to be registered pupils of the hospital. There is a special department for treatment of the eye, ear, throat, and nose, under the charge of Mr. J. Bowring Horgan, and a special dental department. Honorary Secretary: Dr. R. B. Dalton. The Hospital contains a fully equipped Pathological Department, and a large and extensive X Ray Department has recently been added.

Mercy Hospital.—This hospital contains 130 beds for medical and surgical cases. There is also a daily extern for medical and surgical cases, as well as for diseases of the eye, ear, and throat. Extern medical attendances for 1919, 5933; surgical attendances, 2940; eye, ear, nose, and throat attendances, 8170; intern patients, 1526. Major operations, 798; minor operations, 743. Minor accidents, 3010. Total extern free attendances, 36,105. Two resident students. Honorary Secretary to the Staff: Dr. D. J. O'Connor.

*Cork District Lunatic Asylum.**—Psychological Medicine: A course of Clinical Lectures on Mental Disease and Allied Neuroses will be delivered in the Cork District Lunatic Asylum on Mondays and Thursdays, commencing the first Thursday in May, by the Resident Medical Superintendent. All students wishing to enter for the course are expected to attend at the Asylum at 4 P.M. on that day. All information may be had at the Asylum from the resident medical superintendent.

*Victoria Hospital (Incorporated)** (Cork).—There are 75 beds. Clinical instruction on Diseases Peculiar to Children is given. The extern department is open daily at 9.30.

County and City of Cork Lying-in Hospital (Erinville, Western-road; founded 1798).—This hospital contains 22 beds, an Extern Midwifery Department, Gynæcological Department, Extern Department for Women, and Child Welfare Centre. Fee for six months' attendance, including clinical lectures, £5 5*s.* For further particulars apply to Lucy E. Smith, M.D., secretary to staff.

*Cork Maternity** (Batchelor's Quay).—Three resident pupils are taken into the Maternity. Poor women are attended at their own homes. Clinical lectures are delivered during the session. There is an extern department for the treatment of women's and children's diseases. Fee for attendance at clinical lectures and certificate, £3 3*s.* Honorary secretary to staff, Dr. Henry Corby.

*Cork Fever Hospital.**—Upwards of 500 cases of various forms of fever and zymotic disease are treated yearly in this hospital. The Resident Medical Officer gives instruction in Practical Pharmacy, a certificate of which is necessary for the National University and Colleges of Physicians and Surgeons of Edinburgh.

*Cork District Hospital** (Douglas-road; 1200 beds).—This hospital includes special buildings for fever and other infectious diseases (100 beds); for children's diseases (100 beds); and a Lock hospital, the only one in the South of Ireland (80 beds). It affords an extensive field for the study of all classes of diseases, acute and chronic, including special departments for gynæcology and diseases of the skin and nervous system. The physicians and surgeons visit the hospitals every morning at 10 o'clock. Lectures and clinical instruction are given daily in the wards by the physicians and surgeons. Further particulars may be obtained from Dr. W. E. Ashley Cummins, 17, St. Patrick's-place, honorary secretary, medical staff.

Cork Eye, Ear, and Throat Hospital (Western-road).—This hospital is open to students attending the University College and others. Certificates of attendance for three or six months can be obtained. The hospital contains 35 beds. Over 4000 cases are treated during the year. A course of Lectures on Ophthalmic Surgery is delivered during the session. For further information apply to Dr. Arthur Sandford, 13, St. Patrick's-place, Cork.

UNIVERSITY COLLEGE, GALWAY: SCHOOL OF MEDICINE.—The College contains a well-lighted and ventilated dissecting-room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynæcological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. There are 12 Entrance Scholarships, value £25 each, for which Medical Students compete with other Students on the Entrance Course. In the Second, Third, and Fourth Years three Scholarships in each year, value £25 each are reserved for Medical Students. Exhibitions of £10 and £5 are awarded on results of 1st, 2nd, 3rd, and Degree Examinations in Medicine. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies

in the College, including a Biological Society. There are abundant facilities for research and Post-graduate work in the Chemistry, Physiology, and Pathology departments. There are ample facilities for Women Students. Further information can be obtained from the Registrar of the College.

Clinical Instruction is given in the Galway Hospital and in the Galway Union and Fever Hospitals, containing on an average 200 patients.

*Galway County Hospital** (62 beds).—Founded by Act of Parliament.

Galway Union and Fever Hospitals (150 beds).—Clinical instruction is given in these hospitals to the Medical Students of University College, Galway. The regulations for Scholarships tenable in the College, and the regulations for degrees and for courses can be obtained from Messrs. O'Gorman and Co., Galway.

QUEEN'S UNIVERSITY OF BELFAST.

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.). The University also grants a Diploma in Public Health, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine by the General Council of Medical Education and Registration of the United Kingdom; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission as a matriculated student of the University shall pass such Matriculation Examination or fulfil such other test of fitness as may be prescribed by the Senate, which may prescribe the conditions under which students who have passed the Matriculation or Entrance Examination of any other University or College approved for that purpose (or who have fulfilled such other test of fitness as may be prescribed) may be exempted from passing the Matriculation Examination of the University. For information as to Scholarships and Prizes inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations known as the First, Second, Third, and Fourth Medical Examinations respectively.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical Examination may present themselves for this examination at the close of the third year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the First Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery; (4) Ophthalmology and Otology. This examination may be taken in two parts: I., Systematic; II., Clinical, Practical and Oral. Candidates who have previously passed the Third Examination may present themselves for Part I. of the Fourth Examination at the close of the fourth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination. Candidates who have passed Part I. of this examination may present themselves for Part II. at the close of the fifth year, provided that they have fulfilled the necessary requirements as to hospital attendance on the various clinical courses in the subjects of examination. Parts I. and II. may be taken together at the close of the fifth year. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the Second Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject thereof.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The Musgrave Pathological Laboratory.—In this department opportunity is afforded for research in pathology and bacteriology. The department is in touch with most of the hospitals in Belfast, and there is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, the diagnosis of cases of infectious diseases, &c. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in the compounding and dispensing of medicines.

Clinical instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Union Hospitals, the Belfast Hospital for Sick Children, the Belfast Maternity, the Ulster Hospital for Women and Children, the Ulster Eye, Ear, and Throat Hospital, the Belfast Ophthalmic Hospital, the Purdysburn Fever Hospital, and the Belfast District Lunatic Asylum.

Royal Victoria Hospital (300 beds).—Women students are now admitted as resident medical pupils the same as men.

Mater Infirmorum Hospital (200 beds).—Honorary Secretary Medical Staff: Mr. J. B. Moore.

Belfast Union Infirmary and Hospital (1600 beds).—Clinical courses are given biennially, and course for D.P.H. in Hospital. Intern Venereal Clinic in Infirmary under

Corporation scheme. Particulars may be obtained on application, as to classes, to Dr. McLiesh.

Hospital for Sick Children, Queen-street (52 beds).—Honorary Secretary, Medical Staff: John McCaw, M.D.

Incorporated Belfast Maternity Hospital, Townsend-street (32 beds). New Pre-Natal Clinics are being arranged in addition to the present ward clinics.

Ulster Hospital for Children and Women (44 beds).

*Benn Ulster Eye, Ear, and Throat Hospital** (30 beds).

Belfast Ophthalmic Hospital, Great Victoria-street (30 beds).—Practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and Laryngology. Clinical instruction is given daily. Fee for three months £2 2*s*.

Belfast Fever Hospitals.—City Fever Hospital, Purdysburn (330 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-Graduate (D.P.H.) Classes are also held.

Belfast District Lunatic Asylum (1000 beds).

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

The College issues its Licences in Medicine and in Midwifery to practitioners whose names appear on the Medical Register of the United Kingdom.

The Licence in Medicine.—The subjects of examination are: Practice of Medicine, Clinical Medicine, Pathology, Medical Jurisprudence, Midwifery, Hygiene, and Therapeutics.

The Licence in Midwifery.—Candidates must produce certificates of registration. A registered medical practitioner of five years' standing may be exempted from the examination by printed questions.

The Membership.—Examinations for Membership are held in February, June, and November. The fee for the examination is £21 to Licentiates of the College, or £36 15*s*. to non-Licentiates. Further particulars can be obtained from the Registrar of the Royal College of Physicians of Ireland, Kildare-street, Dublin.

The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years. There is a fee of £35 in addition to a stamp duty of £25.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

The Licence in Surgery.—A candidate whose name is entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Conjoint Board of the Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland, preceded by the passing of an Examination in Arts recognised by the General Medical Council, may, at the discretion of the Council, be admitted to the Examination.

Candidates are examined in Surgery, Clinical Surgery, Operative Surgery on the subject, Surgical Appliances, and Ophthalmic Surgery.

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the Final Examination immediately after passing the Primary part, provided they have complied with the necessary regulations. The subjects for the Primary Examination are (*a*) Anatomy, including Dissections; and (*b*) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical Anatomy and Pathology. For admission to the Final Examination the candidate must have passed the Primary Examination, and must be a Licentiate or Graduate in Surgery of a university or licensing body recognised by the General Medical Council; all such candidates must not be less than 25 years of age.

Further particulars as to fees and conditions of examination can be obtained from the Registrar of the College, Stephen's-green, West Dublin.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

Every candidate for the Conjoint Examinations of the Colleges shall produce evidence of having before entering on medical studies passed a Preliminary Examination in general education recognised by the Royal Colleges. Each candidate before receiving his diplomas must produce a registrar's certificate or other satisfactory evidence that he has attained the age of 21 years.

Preliminary Examination.—The subjects for examination are identical with those prescribed for the Preliminary Examination by the General Council of Medical Education and Registration.

Professional Examinations.—Every candidate must pass four Professional Examinations—at the end of the first, second, third, and fifth years respectively of his professional studies. No candidate shall be admitted to the Final or Qualifying Examination within three months of his rejection at the Final or Qualifying Examination by any other licensing body.

First Professional Examination.—Every candidate is required, before admission to the First Professional Examination, to produce evidence—(1) of having passed in the subjects of the Preliminary Examination; and (2) of having attended a course of—(*a*) lectures on Theoretical Chemistry, six months; (*b*) Practical Chemistry, three months; (*c*) Biology, three months; and (*d*) Physics.

The subjects of the First Professional Examination are the following:—1. (*a*) Chemistry; (*b*) Physics. 2. Biology. The fee for this examination is £15 15*s*.

Second Professional Examination.—Candidates are not admissible to this examination till they have passed in the subjects of the First Professional Examination, and they must produce evidence of having attended (*a*) anatomical dissections, six months; and Lectures on (*b*) Anatomy, six months; (*c*) Physiology, six months; (*d*) Practical Physiology and Histology, three months.

The subjects of the Second Professional Examination are the following:—(1) Anatomy; and (2) Physiology and Histology. The fee for this examination is £10 10*s*.

Third Professional Examination.—Every candidate is required, before admission to the Third Professional Examination, to produce evidence of having passed the Second Professional Examination, and certificates of having attended courses of instruction in (*a*) the practice of a medico-chirurgical hospital for nine months; (*b*) Pathology—(1) Systematic, (2) Practical, three months each; (*c*) Materia Medica, Pharmacy, and Therapeutics, three months; (*d*) Forensic Medicine and Public Health, three months. The subjects for the Third Professional Examination are the following:—(1) Pathology; (2) Materia Medica, Pharmacy, and Therapeutics; (3) Public Health and Forensic Medicine. The fee for this examination is £9 9*s*. Clinical instruction in Ophthalmic and Aural Surgery, three months. The examination in Ophthalmic and Aural Surgery may be taken immediately after passing the Third Professional Examination.

Final Professional Examination.—Before admission to the Final Examination candidates must have passed the Third Professional Examination and produced evidence of having attended in Division I. the practice of a medico-chirurgical hospital for two periods of nine months each (unless such evidence has been previously produced for admission in Division II.); the practice of a recognised fever hospital or the fever wards of a recognised clinical hospital, three months; clinical instruction in Mental Diseases, one month (12 attendances); lectures on Medicine, six months at a recognised medical school; of having performed the duties of medical clinical clerk in a recognised hospital for three months; of having attended a

course of instruction in post-mortem examinations and demonstrations during one session. In Division II. of having attended the practice of a medico-chirurgical hospital for two periods of nine months each (unless such evidence has been previously produced for admission to Division I.); lectures on Surgery, six months at a recognised medical school; instruction in Operative Surgery, three months at a recognised medical school; of having performed the duties of surgical dresser in a recognised hospital for three months; of having attended a course of instruction in the practical administration of general anæsthetics. In Division III. of having attended a midwifery hospital or maternity and having been present at 20 labours, six months; instruction on vaccination, six attendances to be certified by a public vaccinator; lectures on midwifery (including diseases peculiar to women and to new-born children), six months at a recognised medical school. Candidates are recommended to present themselves in all the subjects of the Final Examination at one time, but a candidate at or after the end of the fourth year may present himself in any one of the Divisions I., II., or III., provided he has completed his curriculum as far as concerns the division in which he presents himself. The examination in at least one of the divisions must be deferred till the end of the fifth year.

The subjects of the Final Examination are: (1) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (2) Surgery, Operative; and (3) Midwifery and Gynæcology, Vaccination, and Diseases of New-born Children. The fee is £6 6*s*. Further particulars can be obtained from Alfred Miller, O.B.E., the Secretary of the Committee of Management, Royal College of Surgeons, Stephen's-green, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND (SCHOOLS OF SURGERY).—The schools of surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century. They are carried on within the College buildings and are specially subject to the supervision and control of the Council, who are empowered to appoint and remove the professors and to regulate the methods of teaching pursued. The buildings have been reconstructed, the capacity of the dissecting-room nearly trebled, and special pathological, bacteriological, public health, and pharmaceutical laboratories fitted with the most approved appliances in order that students may have the advantage of the most modern methods of instruction. The entire building is heated by hot-water pipes and lighted throughout by the electric light. Winter Session commences in October; Summer Session in April. Scholarships and Prizes: Carmichael Scholarship, £15; Mayne Scholarship, £8; Stoney Memorial gold medal; Operative Surgery, gold and silver medals; Barker Prize, £26 5*s*.; H. Macnaughton-Jones gold medal in Obstetrics and Gynæcology; and class prizes and medals. Prospectuses and guide for medical students can be obtained post free on written application to the Registrar, Royal College of Surgeons, Stephen's-green, W., Dublin.

APOTHECARIES' HALL OF IRELAND.*

The Licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the necessary examinations. The diploma of the Apothecaries' Hall of Ireland entitles the holder to be registered as a practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's Licence. There are three professional examinations, the total fees for which amount to 30 guineas. Women are eligible for the diploma.

There are four examinations—primary, intermediate, Parts I. and II., and final. They are held three times a year, in March, June, and December. The primary examination comprises biology, physics, theoretical and practical chemistry (with an examination at the bench). Candidates holding a Pharmaceutical licence are exempt from this subject. Intermediate, Part I., Anatomy and Physiology. Intermediate, Part II., Pathology, Medical Jurisprudence, and Materia Medica and Pharmacy. The intermediate examination comprises anatomy of the whole body (including practical dissections), physiology, practical histology, and materia medica. The final examination comprises medicine, surgery, and midwifery.

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied on application to the Registrar at 40, Mary-street, Dublin.

HOSPITALS AFFORDING PRACTICE RECOGNISED BY THE IRISH UNIVERSITIES AND CORPORATIONS.[1]

ADELAIDE HOSPITAL, Peter-street, Dublin.*—Fee for nine months' hospital attendance, £12 12*s*.; six months, £8 8*s*. Summer, three months, £5 5*s*. Two resident surgeons are elected yearly and four resident pupils half-yearly. At the termination of the session prizes in Clinical Medicine and Surgery and in Dermatology will be awarded.

Hudson Scholarship.—In addition to the junior prizes the Hudson Scholarship, £30 and a gold medal, as well as a prize of £10, together with a silver medal, will be awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology.

The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. Further particulars may be obtained from Dr. H. Bewley.

COOMBE LYING-IN HOSPITAL AND GUINNESS DISPENSARY FOR THE TREATMENT OF DISEASES PECULIAR TO WOMEN, Dublin.—This hospital contains nearly 70 beds and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. The practice of this hospital is one of the largest in Ireland. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this dispensary. There is accommodation for intern pupils who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Lady medical students can reside in the hospital. The residents' quarters are comfortable. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Fees: Extern pupils for full course of six months, £8 8*s*.; three months, £4 4*s*. Intern pupils, one month, £4 4*s*.; each consecutive month, £3 3*s*.; six months, £18 18*s*.; board and lodging in the hospital, 25*s*. per week. Lady students, intern, one month, £4 4*s*.; each consecutive month, £3 3*s*. Registration fee, in advance, 10*s*. 6*d*. Students can enter for attendance at any time, but preference is given to those entering from the first day of the month. Further particulars may be had on application to the Master or the Registrar at the hospital.

SIR PATRICK DUN'S HOSPITAL, Grand Canal-street, Dublin.—Classes both in Medicine and Surgery are held each morning from 9 o'clock from Oct. 1st till the end of June. Special classes for junior students will be held in the wards during the months of October, November, and December. A Resident Surgeon, with salary, is appointed annually. Six Resident Pupils are appointed each half-year. Six Surgical Dressers and six Clinical Clerks are appointed each month. There are facilities for women students.

Prizes and Medals.—Clinical medals and prizes amounting to about £15 each will be awarded in Medicine and in Surgery respectively in accordance with the will of the late Rev. Samuel Haughton, M.D., S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in Medicine and in Surgery provided they show sufficient merit.

Fees.—Winter and summer session, £12 12*s*.; winter session (six months), £8 8*s*.; and summer session (three months), £5 5*s*. Special certificate in anæsthetics, £1 1*s*. The practice of this hospital is open to all students, and the certificates are recognised by Dublin University, the

[1] This list of the institutions recognised by the Conjoint Board of Ireland is supplemented in the regulations of the Colleges by those hospitals mentioned as recognised institutions in Scotland and England. The recognised facilities for clinical instruction in Belfast, Cork, and Galway have been described in connexion with the Belfast and National Universities.

National University and Royal Colleges of Surgeons of England, Ireland, and Scotland.

Further information will be supplied by the Hon. Secretary to the Medical Board.

JERVIS-STREET HOSPITAL, Dublin.—Founded 1718; rebuilt 1886. 130 beds. A new out-patient department has been completed and contains all modern requirements. Secretary: Mr. Kieran O'Dea.

MATER MISERICORDIÆ HOSPITAL, Dublin.—This hospital, the largest in Ireland, containing 382 beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction will be given by the Physicians and Surgeons at 9 A.M. daily. Ophthalmic Surgery will be taught in the Special Wards and in the Dispensary. Surgical Operations will be performed daily. Connected with the hospital are extensive Dispensaries, which afford valuable opportunities for the study of general Medical and Surgical Diseases, and Accidents. Instruction will be given on Pathology and Bacteriology. Three House Physicians, six House Surgeons, and 16 resident pupils will be elected annually. Dressers and Clinical Clerks will also be appointed, and certificates will be given to those who perform their duties to the satisfaction of the staff. Leonard Prizes will be offered for competition annually. For further particulars see prospectus. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom. There is a Private Hospital for the reception of Medical and Surgical cases; also a Training School and a Home for Trained Nurses in connexion with the Hospital.

Terms of attendance.—Nine months, £12 12*s.*; six winter months, £8 8*s.*; three summer months, £5 5*s.* Entries can be made with any of the physicians or surgeons, or with the Registrar, Dr. Martin Dempsey, 35, Merrion-square. A prospectus containing in detail the arrangements for Clinical Instruction, Prizes, &c., may be obtained from the Secretary, Medical Board, Mr. H. Barniville, 9, Merrion-square.

MEATH HOSPITAL AND COUNTY DUBLIN INFIRMARY.—This hospital was founded in 1753 and now contains 166 beds available for clinical teaching. A building containing 40 beds for the isolated treatment of fevers is attached to the hospital. The certificates of this hospital are recognised by all the universities and licensing bodies of the United Kingdom. Medical Clinical Clerks and Surgical Resident Pupils and Dressers are appointed every three months, and House Surgeons and Clinical Assistants are elected annually. A prospectus giving the complete arrangements for the coming session may be obtained from the Honorary Treasurer of the Medical Board, Sir L. H. Ormsby, 92, Merrion-square, Dublin.

MERCER'S HOSPITAL.—This hospital, founded in 1734, is situated in the centre of Dublin, in the immediate vicinity of the Schools of Surgery of the Royal College of Surgeons, the Catholic University School of Medicine, and within five minutes' walk of Trinity College. It contains 120 beds for medical and surgical cases, and arrangements have been made with the medical officers of Cork-street Fever Hospital whereby all students of this hospital are entitled to attend the clinical instruction of that institution and become eligible for the posts of Resident Pupil, &c. There is a large dispensary for out-patients. Students of the hospital are permitted to attend the gynæcological department, where they receive practical instruction. There are special wards for the treatment and study of children's diseases. During the past few years the hospital has undergone extensive alterations in order to bring it up to modern requirements.

Appointments.—A House Surgeon is appointed annually. There are Six Resident Pupils, and Clinical Clerks and Dressers are appointed from amongst the most deserving members of the class. Women students are admitted.

Fees.—Winter, six months, £8 8*s.*; Summer, three months, £5 5*s.*; nine months, £12 12*s.*

For further particulars apply to Dr. Bethel Solomons, Hon. Sec., Medical Board, 42, Fitzwilliam-square, Dublin.

NATIONAL MATERNITY HOSPITAL, Holles-street, Dublin.—Established 1894. The Hospital consists of an Intern and Extern Maternity, and a Dispensary for the treatment of Diseases of Women and Children. About 1035 cases are admitted and over 300 operations are performed annually. Every facility is given for the carrying out of practical work. Post-graduate and special courses are arranged for at any time. Certificates of attendance at this hospital are recognised by all the licensing bodies. Terms (three months' course) 6 guineas. Board 30*s.* per week. Medical men can take out Post-graduate courses by paying a fee of £3 3*s.* for the first month. If he wishes to remain a second month the fee is £2 2*s.* Clinical Lectures are given daily and Oral Lectures four times per week. Further particulars can be obtained from the Masters: Sir Andrew Horne, 94, Merrion-square, Dublin; Dr. Reginald J. White, 23, Merrion-square, Dublin; or from the Secretary, Holles-street, Dublin.

RICHMOND, WHITWORTH, AND HARDWICKE HOSPITALS (HOUSE OF INDUSTRY HOSPITALS), Dublin.—These hospitals contain 330 beds—130 for Surgical cases, 80 for Medical cases, 78 for Fever and other Epidemic Diseases, and an Auxiliary Wing of 42 beds. Their pecuniary position has been recently very precarious. A Resident Physician and a Resident Surgeon are appointed each half year and are paid for their services. 12 Resident Clinical Clerks are appointed each quarter and provided with furnished apartments, fuel, &c. These appointments are open not only to advanced Students but also to those who are qualified in Medicine and Surgery. The Dressers are selected from among the best qualified of the pupils without the payment of any additional fee. Women students are eligible for election as residents and special apartments are reserved for their use. For prospectuses apply to Mr. Adams McConnell, F.R.C.S.I., Hon. Secretary, 69, Fitzwilliam-square, Dublin.

ROTUNDA HOSPITAL, Dublin.—This institution is the largest combined gynæcological and maternity hospital in the British Empire. Over 4000 confinements attended annually. Students can take out their necessary gynæcological and midwifery practical courses. Appointments open to qualified practitioners as Assistant to the Master and Extern Assistants. Women students can reside in the hospital on terms similar to those for men. Fees for intern students: One month £6 6*s.*, two months, £9 9*s.*, three months £12 12*s.*, six months £21, single months other than the first £4 4*s.* For further particulars apply to the Master.

ROYAL CITY OF DUBLIN HOSPITAL.*—Founded 1832; enlarged 1851; rebuilt 1893. 150 beds. There is a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. Secretary: Mr. Edw. B. Armstrong.

ROYAL VICTORIA EYE AND EAR HOSPITAL, Dublin.—Established 1844. Incorporated 1897. 102 beds. In-patients, 1610; out-patients, 9386. Two house surgeons for Eye and one for Ear appointed annually.

DR. STEEVENS' HOSPITAL, Dublin.—Established 1720. 250 beds. Patients, 12,834. Secretary: Mr. R. J. Ogden.

ST. VINCENT'S HOSPITAL AND DISPENSARY, Dublin.*—Established 1834. 200 beds.

WE take this opportunity of thanking the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

THE CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.—Incorporated by Royal Charter, June 9th, 1920, and amalgamating the Incorporated Society of Trained Masseuses and the Institute of Massage and Medical Gymnastics. The Chartered Society has been formed for the purpose of affording protection to the profession of massage and to its registered members: by improving the training and status of masseuses and masseurs, by providing and supervising independent examinations, by setting up registers of persons qualified to practice, by arranging post-graduate courses, lectures, and conferences, by supplying work for members (under registry regulations), and by working in all ways for the advancement and general welfare of the profession. Registration with the Chartered Society is open to all certificate holders of the Incorporated Society and of the Institute. Test examinations will be set up for the benefit of masseuses and masseurs of experience, holding certificates other than the above-mentioned, who wish to register with the Chartered Society. Forms of application for registration and all information can be obtained from the offices of the Society, 157, Great Portland-street, W.1.

THE LANCET.

LONDON: SATURDAY, AUGUST 28, 1920.

Medical Training and the Clinical Units.

THE educational year opens in circumstances uncertain and involved for all the nations that on earth do dwell, and as it is the grand privilege of medicine to possess and cultivate universal inter-relations it follows that every moral and material trouble which falls upon man is reflected in medicine, and reflected as much in the training of the students as in the conduct of general practice and the progress of scientific research. All the training of the medical student during the next year must be carried on under the grave disabilities that the curriculum becomes steadily more costly, that those who pay for it possess for the most part less resources from which to find the money, and that the institutions, hospitals, schools, laboratories, and special clinics alike are suffering from the straitness of the times. No students can be so directly affected by the post-war conditions as those who desire to follow medicine. It may therefore be regarded as a triumph for our profession that never, so far as we know, have so many young persons felt an urgent call upon them to enter the ranks of medicine; and in this country the triumph is shared by the new Ministry of Health, for the readiness of the recruiting must indicate belief in the soundness of the promised reorganisation of the medical services of the country. Our young men and women are thinking, and their parents and guardians are sharing the thought, that the profession of medicine in the future, though sorely tried in the present, will emerge not only as a career whose nobility has been insisted upon to nausea, but as one whose orderly scheme will promote domestic, social, and international amelioration in the interests of the whole civilised world.

In the Students' Number we set out, as usual, the patterns of medical training in the three divisions of the country, indicating in this way what has to be done by the aspirant before he can be admitted to our ranks; and under various special headings the attempt is made to show how varied are the openings which lie ahead and how genuine are the prospects of a successful as well as a useful life which attend the earnest student. A particular development in medical education to which we propose to call attention now is the establishment of clinical units in connexion with the great teaching hospitals, the immediate reference being to what has been happening at certain of the London medical schools. We have frequently referred to the gradual evolution of special departments of the medical curriculum, and this year a distinct step forward can be chronicled. For the institution of clinical units illustrates the development of the medical student from the apprentice who learned by watching his master into the undergraduate taught by university professors. This development has long remained arrested at a certain point, but if the dates of reform have lingered it must be remembered that under the older plans this country was an acknowledged leader in clinical medicine and a pioneer in science. In other words, the reasons for change were inconspicuous. Time was when the whole of medical education was in the hands of the working leaders of the profession, and grand was our progression in those simpler days. But as our learning became more intense as well as more far-ranging, the preliminary and intermediate subjects passed into the hands of teachers with special equipment, the instruction in the principles of medicine and surgery being left to the honorary staffs of the voluntary hospitals. These men earned their living by private practice, carried on in time that was already heavily pledged to gratuitous labour in the wards. Scientific research and systematic teaching of the students were prosecuted, in addition to their duties to private and hospital patients, and with results of which all may be proud. But the strain was obviously too great, while in election to the honorary staff capacity or inclination for teaching carried but little weight. Nor was the appointment of the clinical teachers under the control of the medical school attached to the hospital, so that every teacher was a law to himself, and the whole organisation was at the mercy of the less conscientious members of the staff. That these were few proves the rectitude and enthusiasm of a large number of men, but for some time it has been known that a more efficacious and orderly scheme, one less dependent upon personal sacrifice, must be found to supplement the clinical education of the student. The institution of clinical units should bring the education of the student up to the level of the progressive learning which has now to be dealt with.

The appointment of whole-time or part-time professors selected for their clinical and teaching power, and proved capacity for research, is supplemented by suitable assistants, and the professors will arrive by detailed arrangement at close relation with the student; it is designed thus to maintain the traditional features of the British system of clinical training, while correcting defects that have arisen in that system as our science has progressed. The student's appointments and the order in which he takes various parts of the clinical curriculum differ with each medical school, and a representative of THE LANCET recently visited the five medical schools which have adopted the clinical unit system in order to learn the details of its interpretation. These details will shortly be published in our columns, when it will be seen that each school has incorporated a professorial unit without in any way losing its special characteristics. In each of the five schools which have established clinical units special rooms and laboratories have been allocated or are to be constructed for research, and the assistant directors as well as the directors will have opportunities of investigating patients under their own charge as in-patients. In every case it is proposed eventually to institute research studentships, so that promising juniors may be trained, after qualification, in the methods of research. The arrangements for research will vary with the individual bias of the investigators and, moreover, have no direct connexion with the undergraduate, except in so far as he is being taught by men who are keenly alive to the importance of discovering a scientific basis for medical practice. For graduate and undergraduate alike the institution of clinical units marks a great stride forward in medical training.

NAVAL MEDICAL SERVICE.

THE life offered to officers of the Royal Naval Medical Service is one that ought to appeal to a large section of recently qualified medical men. More, we have here a career which, in our opinion, many students should set before them as an object. The reasons for this opinion, we may say, are very similar to those which might induce a young medical man to enter any of the sister Services, and there is no intention in what follows, under this or the subsequent headings, to pit one Service against the other or recruit in one direction more than in another. The terms of service and the particular regulations should suffice to give each man the necessary impetus for a decision. The regulations can be obtained from the Admiralty and should be studied strictly.

In the Royal Naval Medical Service the young medical officer obtains these advantages. He sees the world in congenial company and with an assured position, the pay is good, the pensions are commensurate, and the opportunities offered now for scientific work are real, while, if they are taken, promotion awaits the officer on grounds of professional merit.

The candidate who passes the examination for entry undergoes, as acting Surgeon-Lieutenant, a course of instruction at the Royal Naval College, Greenwich, in tropical medicine and hygiene. Further training is given at Haslar in naval hygiene, physical training, and other special branches of work. Seniority as a Surgeon-Lieutenant is determined by the sum-total of the marks obtained at the entrance examination and those on leaving Haslar. He can now hold an appointment as resident medical or surgical officer in a recognised civil hospital for a period of one year, which period will reckon to his credit for increase of pay, retired pay, and gratuity, provided that he completes four years' service in the Navy exclusive of the time so spent. He has thus every chance from the commencement of actual naval employ of being equipped practically as well as scientifically.

Rank of Surgeon Lieutenant-Commander will be granted to surgeons at the expiration of six years from date of entry, and the point upon which stress should be laid is that special promotion can be made in cases of conspicuous professional merit, which is thus placed on a par with general service. Six years later the period of promotion to Surgeon-Commander is reached, after having passed the qualifying examination, when again special promotions can be made for conspicuous professional merit as well as for distinguished service; but promotions are limited in number, save, of course, for gallantry in action. This recognition of professional attainment should prove a very real incentive to progressive scientific work. The same principle prevails in the higher ranks. Promotions to Surgeon-Captain and later to Surgeon Rear-Admiral are made strictly by selection, but are confined to officers who prove themselves to be fitted, both professionally and as administrators, for this rank.

In this connexion we cannot do better than quote a communication from a Surgeon Rear-Admiral to whom it fell to interview a large number of medical officers who served with the Navy in a temporary capacity during the war. These men had had experience, and could give an opinion of the life, its scopes and chances, though only from the point of view of war service. But they had experienced the most trying side of naval life, and their views would expose any objections, if such there are, against the career of a naval medical officer as not giving adequate scope for a full professional life.

The first satisfactory thing to mention is that those who thought scope was wanting were mostly young men, fresh from the schools, and undoubtedly deprived of freedom or initiative through the exigencies of war. The older men who had experience of civil practice looked at the situation more broadly, for they had standards of comparison which they could employ. They were able to comprehend better what the words "professional work" implied, and did not conceive their scope limited because in ministering to the wants of a selected community of healthy men living under strict discipline there was necessarily much routine and some monotony. They looked steadily at the facts, and found that professional work in a modern battleship includes a large variety of medical and surgical cases, both acute and chronic, while emergency operations, such as those for abdominal conditions, may frequently occur. Naval life in these circumstances may lead to opportunities for putting into practice much of what has been learned in the clinical wards of a hospital. Further, the opening for preventive medicine is large and many-sided, while appointments to the large shore establishment enables medical officers to keep their work, of all kinds, up-to-date.

The introduction of new methods of preparation, new chemical explosives as well as the extraordinary behaviour of common articles under extraordinary conditions of stowage, furnish perpetual problems and surprises for the medical officer on board ship, and bring him into intimate connexion with his charges in a way that is particularly necessary considering the conditions of life. No medical officer can expect to succeed unless he secures the confidence of those committed to his charge, and the health lectures which he is bound to deliver will be much more fruitful if they are delivered to an audience which trusts him. Moreover, the delivery of official lectures does not end this side of the medical officer's duties. He must be ready to answer questions, sometimes of real acuteness, which are put to him by the modern blue-jacket, and he will find that his lectures will often afford a starting point of work that may develop into great professional interest. Thus, without his being necessarily a psychologist, his influence will be felt by both officers and men, until the wellbeing of the ship may be profoundly affected by the extent of his tact and skill; for example, small matters assume undue proportion under stress of confinement, and the medical officer should be quick to detect danger signs and warn his commanding officer. Numerous changes have been introduced during the last 20 years into the naval dietary, many of which were the outcome of representations and research by naval medical officers. The work wants carrying on, for much of it has gone to show that the food problem is very complicated. Every medical officer on board ship should make himself acquainted with food values and the human powers of assimilation under varying conditions of work and climate, and here there is ample scope for research. The modern requirements of gunnery and navigation necessitate precision in their use and have made ophthalmology a valuable subject for study in the Navy. The physical training of both officers and men is based on physiological axioms which are peculiarly the field of the medical officer; this training should be the subject of a watchful eye. There is no lack of scope here for professional work without making any reference to the vast problems which have to be faced when the medical officer has to arrange his particular department to the best advantage during or after an action. It is certain that he will not be able to do this unless in times of peace he gets himself ready by study. Lastly, there is the whole field of venereal and tropical disease.

The young medical officer need not be afraid that his work will be without scientific interest if he takes the opportunities offered him.

The rates of pay and pension are as follows:—

RATES OF PAY.

—	Year of 365 days.			One day.		
	£	s.	d.	£	s.	d.
Surgeon Rear-Admiral...	1916	5	0	5	5	0
Surgeon-Captain:						
On promotion	1186	5	0	3	5	0
After 3 years' seniority	1277	10	0	3	10	0
,, 6 ,, ...	1368	15	0	3	15	0
,, 9 ,, ...	1460	0	0	4	0	0
Surgeon-Commander:						
On promotion	821	5	0	2	5	0
After 3 years' seniority	894	5	0	2	9	0
,, 6 ,, ...	967	5	0	2	13	0
,, 9 ,, ...	1040	5	0	2	17	0
Surgeon-Lieutenant-Commander:						
On promotion	638	15	0	1	15	0
After 3 years' seniority	675	5	0	1	17	0
Surgeon-Lieutenant:						
On entry	438	0	0	1	4	0
After 3 years' seniority	529	5	0	1	9	0

On first appointment to the Service, Medical Officers will receive full pay from date of appointment, but subject to the provisions of Article 1347 of the King's Regulations, 1913.

Flag Allowances.

An allowance of 5*s.* 0*d.* a day in addition to full pay is granted to the Senior Medical Officer of a flagship bearing the flag of a Commander-in-Chief. An allowance of 2*s.* 6*d.* a day is granted to the Senior Medical Officer of a ship bearing other flags or broad pendants.

RATES OF PENSION.

Compulsory retirement will be as follows:—

(i) Surgeon Rear-Admirals retire at the age of 60 with retired pay at the rate of £900 per annum plus £22 per annum for each year's service over 27 years counting for retired pay, subject to a maximum rate of £1010 per annum. If, however, less than 27 years' service counting towards retired pay is rendered, a deduction of £22 per annum is made for each full year wanting to complete that period, subject to a minimum of £790 per annum.

(ii) Surgeon-Captains retire at the age of 55. Maximum retired pay, £900.

(iii) Surgeon-Commanders retire at the age of 50. Maximum retired pay, £600.

(iv) Surgeon Lieutenant-Commanders and Lieutenants retire at the age of 45. Maximum retired pay, £450.

Subject to these maxima, the rates of retired pay for Surgeon-Captains, Surgeon-Commanders, Surgeon Lieutenant-Commanders, and Surgeon-Lieutenants are as follows:—

Age on retirement.	Retired pay.	Period of service (years) counting towards retired pay.	(A) Addition.	(A) Deduction.	Age on retirement.	Retired pay.	Period of service (years) counting towards retired pay.	(A) Addition.	(A) Deduction.
	£ (p.a.)		£ (p.a.)	£ (p.a.)		£ (p.a.)		£ (p.a.)	£ (p.a.)
55	790	24	22	15	47	562	20	15	15
54	765	24	22	15	46	525	20	15	15
53	742	23	22	15	45	478	19	15	15
52	720	23	22	15	44	450	19	15	15
51	697	22	22	15	43	4 2	18	15	15
50	675	22	15	15	42	375	18	15	15
49	637	21	15	15	41	337	17	15	15
48	600	21	15	15	40	300	17	15	15

(P.a.) = per annum.

(A) Addition for each full year's service in excess of that specified in column 3 or deduction for each full year wanting to complete that period of service—addition or deduction limited to five years in each case.

ARMY MEDICAL SERVICE.

THE recent alterations in the conditions of service in the Royal Army Medical Corps, which constituted, as we said at the time, the greatest reform that has taken place in that Service for a generation, have well fulfilled their promise. For many reasons which are obvious and have been detailed on previous occasions, the Service can be thoroughly recommended to young medical practitioners. The Regulations should be obtained from the Army Medical Department, and carefully studied.

These are the things which the man who contemplates joining the Service should bear in mind The rates of pay and allowances are good; the chances of seeing the world and the opportunities for post-graduate study are generous, and the work is nowadays varied, responsible, and interesting from a scientific point of view. At certain periods in his career the young officer is relieved from all other duties from six to nine months for the purpose of post-graduate study. During this period he is on full pay and the fees for his courses of instruction are paid by the State. His time is devoted to post-graduate work, and the leading clinical and scientific institutions are coöperating to secure that this post-graduate work shall be real and fruitful. At the same time in districts where the privilege would be of the most practical value opportunities are forthcoming for young officers to attend the clinical practice of large local general hospitals.

By a Royal Warrant issued in September, 1919, medical and combatant officers were placed on the same footing as regards retired pay, and the fact that medical officers enter the Service after a long and expensive training some five years later in life than combatant officers was overlooked. This inequality of treatment has now been rectified, with the result that a medical officer of 20 years' service or over gets £75 per annum more pension than a combatant officer with the same number of years service.

Once again let us deal with the most frequently repeated criticism of the Service—namely, that administration eternally takes the *pas* of science. The Directorates in Pathology and Hygiene which were recently created in the R.A.M.C., and which we may say have proved a marked success, form a complete answer to such criticism, however just it was in the past. This scheme of creating Directorates permits specially selected men to rise from all ranks to Major-General on the strength of their scientific work. Hitherto, a few notable men being excepted, the rule in the R.A.M C. has been that, whatever a man's qualifications or abilities, on attaining the rank of Lieutenant-Colonel, he must be prepared to go off into administrative work and leave his scientific duties to his juniors. If he preferred to remain working in bacteriology, in preventive medicine and hygiene, or in tropical diseases, for example, he could do so, but, except in extraordinarily fortunate circumstances for himself, he would find that his devotion to science had cost him all chances of promotion in his Service, promotion being reserved for the administrative billets. The arrangement was wasteful as well as mortifying. How could the younger men be expected to preserve their interest in their scientific studies if such was the outcome? And how could their seniors be expected to remain in touch with the scientific developments in whose working out they no longer had any personal share? This now has all been changed, largely owing to the work of Sir John Goodwin, Director-General of the Service, with the assistance of Sir William Leishman and Sir William Horrocks. The change has its expression in these Directorates. Time was found during the last year of the war to prepare a scheme of reform, and to-day all up to and including the rank of Lieutenant-Colonel can draw specialist pay and hold appointments carrying allowances. The following substitutions for Articles 360 and 361 in the Royal Warrant for Pay Appointment, Promotion, and Non-effective Pay indicate the position. (See THE LANCET, Dec. 27th, 1919.)

Additional Pay and Charge Pay for Officers of the R.A.M.C.

The alterations, made under Army Order 411, 1919, became effective as from Jan. 1st, 1920:—

(1) In Article 360, *for* "officer under the rank of lieutenant-colonel appointed by Our Army Council as specialist ..... 2*s.* 6*d.* a day," the following is substituted:—

"Officer not above the rank of lieutenant-colonel, while acting as specialist in a post considered by Our Army Council to merit the grant of additional pay, according to subjects or groups of subjects as under, within a limit of 5*s.* a day:—

Operative Surgery, advanced; Medicine; Ophthalmology; Gynæcology and Midwifery; Dermatology, including Venereal Disease, 5*s.* daily.

Otology, Laryngology, and Rhinology; Radiology; Anæsthetics; Mental Diseases; Hygiene; Pathology; subjects other than above, at the discretion of Our Army Council, 2*s.* 6*d.* daily.

Officers granted temporary higher rank while holding appointments in the services of hygiene and pathology will not be eligible for additional pay as specialists while holding such temporary rank."

(2) The following is substituted for Article 361 (*a*):—

"(*a*) Officer in charge of a hospital.—If the number of equipped beds, as certified by the Deputy Director of Medical Services, exceeds—

50 beds	2*s.* 6*d.* daily.	300 beds	7*s.* 6*d.* daily.
150 ,, ...	5*s.* 0*d.* ,,	500 ,, ...	10*s.* 0*d.* ,,

Officer in charge of a medical or surgical division of a general hospital with not less than 300 beds—half the above rates."

Further, an officer, graded as a specialist, and appointed to the charge of a medical or surgical division of a general hospital may be allowed to retain his additional pay and to draw the rate of charge pay laid down for the officer in charge of a medical or surgical division of a general hospital, provided that the total of additional and charge pay so drawn does not exceed the rate of charge pay drawn by the officer in charge of the hospital. With this exception charge pay and additional pay as specialist will not be issuable concurrently. It may be here pointed out that the distinction between scientific and administrative work is largely verbal. Take the conduct of a large hospital—is it possible to separate the scientific routine which is designed to ensure progressive therapeutics from the administrative work which provides and maintains the premises and service, and selects and oversees the personnel?

Under the conditions enumerated the possibilities for good workers is very great in the R.A.M.C.; they will attain to positions of proper trust and emolument by scientific work. This should much improve recruiting among the officers of the R.A.M.C. But there will almost certainly follow arrangements by which all special medical service will receive higher consideration in the Corps. Not only is there in the work of the Army Medical Department scope for original labour and research in tropical disease, in preventive medicine, and in bacteriology, as well as in the vast clinical field open to the specialist

in medicine, surgery, or gynæcology, in venereal disease, in ophthalmology, and so on, but it is proposed to develop a scheme whereby child welfare shall be undertaken systematically by the R.A.M.C. A scheme of this sort is already running successfully at Aldershot, and we see in this direction a fine opening for preventive medicine, and one which should bring the officers of the R.A.M.C. into touch with the soldiers in a valuable and intimate manner.

Lastly, we may remark that the appointment of a Consultant in Surgery, with the duty to visit all commands and advise the Director-General from inspection on the spot with regard to the conduct of hospitals, the scientific work in them, and the qualities of the personnel, should ensure a high standard of performance, if only because of the satisfactory feeling that good work will not by accident remain unnoticed. The present holder of the post is Colonel E. M. Pilcher, recently professor of surgery in the Royal Army Medical College.

RATES OF PAY AND PENSION.

The following table shows the

Total Emoluments: Royal Army Medical Corps.

Appointment.	Pay.	Rations.	Servant.	Married.			Unmarried.		Total per annum.	
				Lodging.	Fuel and light (average).	Furniture allowance.	Lodging.	Fuel and light (average).	Married.	Unmarried.
	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£	£
Lieutenant	1 2 0	2 1	2 0	3 6	1 0	2 0	2 3	0 10	594	532
Captain...	1 7 0	2 1	2 0	4 6	2 0	2 0	3 0	1 2	722	643
Captain—										
After 5 years...	1 7 6	2 1	2 0	4 6	2 0	2 0	3 0	1 2	731	652
,, 6 years...	1 8 0	2 1	2 0	4 6	2 0	2 0	3 0	1 2	740	661
,, 10 years...	1 11 0	2 1	2 0	4 6	2 0	2 0	3 0	1 2	795	716
Major	1 15 0	2 1	2 0	4 6	2 0	2 0	4 0	1 7	863	815
Major, after 15 years	2 0 0	2 1	2 0	4 6	2 0	2 0	4 0	1 7	959	907
Lieutenant-Colonel ...	2 10 0	2 1	2 0	4 6	2 0	2 0	4 6	1 7	1142	1098
Lieutenant-Colonel, after 20 years	2 12 6	2 1	2 0	4 6	2 0	2 0	4 6	1 7	1187	1144
Lieutenant-Colonel, after 25 years	2 15 0	2 1	2 0	4 6	2 0	2 0	4 6	1 7	1233	1189
Colonel	3 5 0	2 1	2 0	5 6	2 10	2 0	5 6	1 10	1449	1395
Major-General ...	4 15 0	2 1	4 0	11 0	3 7	2 0	11 0	2 7	2147	2092

Charge pay (2*s.* 6*d.*–10*s.* per day) and specialist's pay (2*s.* 6*d.*–5*s.* per day)—i.e., from £45–£180 per annum—in addition for a considerable percentage of officers.

Retirement and Retired Pay.

The following are the rates of pension and retired pay:—

1. Retired pay will consist of two parts: (*a*) a service element based on the officer's total service; (*b*) a rank element for the rank from which the officer retires. An officer with less than 20 complete years' service will not be eligible for retired pay.

2. The scale will be as follows:—

(*a*) Service element.—£15 a year for each completed year of service.
(*b*) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£	£	£
Major	12	12	120
Lieutenant-Colonel	150	30	240
Colonel	290	50	390
Major-General ...	440	50	540
Lieutenant-General	590	50	690
General	740	50	840

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below.

Maximum rates of retired pay (*a*) and (*b*) together:—

	£		£
Captain and Subaltern ...	300	Colonel	800
Major	450	Major-General	1000
Lieutenant-Colonel	600	Lieutenant-General	1200

Officers with 8½ and less than 20 years' service may be permitted to retire with a gratuity varying from £1000 to £2500.

INDIAN MEDICAL SERVICE.

THE Indian Medical Service differs from all the other State Services in that it combines the attractions of a military and a civil career. It is primarily a military service, and all officers on first landing in India are detailed for service with Indian troops in Indian military station hospitals. After a period of military duty, which before the war varied from four to eight years, the majority of officers elected for and were transferred to the civil side. While in civil employ they constitute the war reserve for the Indian Army. During the great war practically all officers not occupying administrative posts or filling essential civil duties were called up for military service.

The possibilities of medical and surgical work and the opportunities for research in all directions which the Service affords have always proved of great attraction, though in recent years the Service has lost its former popularity in the medical schools, and for some time prior to the war competition among highly qualified European candidates was not keen. Under the changed conditions in India the pay and emoluments were insufficient, and the terms of service were out of date. The whole constitution and organisation of the Service has recently been under examination by a Medical Services Committee. The report of this Committee has not yet been published, but it is understood that its recommendations are such as seem likely to restore the Indian Medical Service to its former high position and prestige among the State Services. Meanwhile, the pay, pensions, and leave reserve have been substantially increased, whilst questions relating to furlough pay, passages, status of administrative officers are in process of satisfactory settlement. The Station Hospital system has been introduced and command allowances and second in command allowances have been granted for charge of hospitals. These reforms, now happily ensured, have completely altered the outlook. Young medical practitioners can now join the I.M.S. and be secure of a competency from the day they receive their commissions. We can therefore recommend the Service to them. The British Medical Association is using its best endeavours to stimulate and help in recruiting.

A great career is open to any young medical man with the proper qualifications and keen on his profession. During the first few years while on military duty the young officer becomes acquainted with and is trained in Indian military medical organisation. He acquires experience in dealing with the different races and castes which comprise the Indian Army. He learns the language and customs of the country. He familiarises himself with the practice of tropical medicine and surgery, and has leisure to pursue his further studies with time for recreation and sport in any direction his inclination may dictate. During these years he can make up his mind as to which branch of professional skill he wishes to devote special attention, and whether he is desirous of remaining in military employ throughout his service. Specialist appointments are available on both the military and civil sides.

On the civil side, and the majority of officers are civil surgeons in charge of districts and the civil district hospitals, the work is heavy and interesting, the bulk of it being surgery. There is no country in the world which offers better opportunity for the young surgeon once he has acquired the confidence and esteem of the inhabitants. Private practice is permitted, but it may be stated at once that the emoluments from this source, except in the Presidency or large towns, are generally negligible. Nevertheless, with the pay as it now exists, plus certain minor allowances, the civil surgeon is in a position to live reasonably in his earlier years, and can confidently expect, should his professional qualifications and reputation merit his preferment, to be selected for the higher professional posts where a lucrative practice is obtainable. I.M.S. officers are eligible for the professorships at the Medical Colleges in Calcutta, Bombay, Madras, Lahore, and Lucknow in the various subjects comprising the medical curriculum. The bacteriological, sanitary and chemical examinerships, work as alienists, and in the jail departments open out careers of a truly varied and valuable kind for those who wish to devote themselves mainly to scientific research or specialist work. The bacteriological laboratories and Pasteur institutes at Kasauli, Bombay, Coonoor,

Shillong, and Rangoon are splendidly equipped with provision for research workers. In addition to the scales of pay laid down, allowances are granted for service in the above departments.

Under the study leave rules officers are entitled during their service to a year's study leave in England. This period counts as duty, and is in addition to furlough. It is granted on the basis of one month's study leave for each year's active service up to a total maximum of 12 months. Most officers take it in two periods of 6 months each, and add it on to their ordinary furlough. During the period of study leave they are at liberty to pursue courses of approved study in any country. They receive furlough pay plus an additional lodging allowance of 12*s*. a day. The opportunity thus provided for continuing post-graduate studies for a period of six months twice in his service is invaluable both to the individual and the State.

Accelerated promotion of six months to the rank of major is granted to officers for approved study or for obtaining the higher medical qualifications.

As regards leave, the Secretary of State has undertaken to increase the leave reserve to 25 per cent. and maintain the 2½ per cent. study leave in addition. These percentages when worked up to are considered ample.

The Secretary of State has further undertaken that officers of the I.M.S. on the military side will receive the same concessions as regards passages as combatant officers, while officers on the civil side will receive the same concessions, if any, as may be granted to other officers in employ.

The rates of basic pay and pensions are given below :—

NEW RATES OF PAY.

Rank.	Year of service.	Basic pay.	Overseas allowance.	Total basic pay and overseas allowance.
		Rs.*	Rs.	Rs.
Lieut. ...	1	500	150	650
	2	500	150	650
	3	500	150	650
Capt. ...	4	650	150	800
	5	650	150	800
	6	650	150	800
	7	750	200	950
	8	750	200	950
	9	750	200	950
	10	850	200	1050
	11	850	200	1050
	12	850	200	1050

Rank.	Year of service.	Basic pay.	Overseas allowance.	Total basic pay and overseas allowance.
		Rs.	Rs.	Rs.
Major ...	13	950	250	1200
	14	950	250	1200
	15	950	250	1200
	16	1100	250	1350
	17	1100	250	1350
	18	1100	250	1350
	19	1250	250	1500
	20	1250	250	1500
Lieut.-Col. ...	21	1500	250	1750
	22	1500	250	1750
	23	1500	250	1750
	24	1600	250	1850
	25	1600	250	1850
	Over 25 on S.L.	1700	250	1950
		1850	250	2100

* The present exchange value of the rupee is about 1*s*. 10¾*d*.
S.L. = Selected List.

Charge allowances and second-in-command allowances for station hospitals will be admissible in addition to the above rates of pay at the following rates :—

(a) *Charge Allowance.*

	Rs. per mensem.
1st class hospitals	240
2nd class hospitals	180
3rd class hospitals	120
4th and 5th class hospitals	nil.

(b) *Second-in-Command Allowance.*

	Rs. per mensem.
1st class hospitals	120
2nd class hospitals	90

All existing general allowances paid to holders of professional and bacteriological appointments and certain other special classes of appointments on the civil side to be maintained.

Indian officers who have joined or may join the Service after Dec. 1st, 1918, will draw, as from Jan. 1st, 1920, pay in accordance with the basic scale set forth below, unless they are already drawing pay at a higher rate, in which case they will continue to enjoy the benefit of that rate for so long as they would otherwise have done; but they will not receive any further increment until it is due to them under the basic scale.

PENSIONS.

The pension rates as now revised give £400 a year after 17 years' service, increasing to £800 after 27 years' service. Formerly the rate was £300 after 17 years' service, increasing to £700 after 30 years' service.

Pension Rates.

After 17 years' service ...	£400	After 23 years' service ...	£620
,, 18 ,, ...	430	,, 24 ,, ...	660
,, 19 ,, ...	460	,, 25 ,, ...	700
,, 20 ,, ...	500	,, 26 ,, ...	750
,, 21 ,, ...	540	,, 27 ,, ...	800
,, 22 ,, ...	580		

Additional pensions for administrative officers :—

Colonel, after two years' active service as such	£125
After four years	250
Major-General, after one and a half years' active service as such	300
After three years	350

It is quite impossible to foretell how and to what extent the civil side of the I.M.S. will be affected by the Indian Reform scheme now about to be introduced. The Act does not touch in any way on the military side of the Service. The essence of the reform is in the increasing participation of Indians in the government of the country, and consequently we consider it right to draw the attention of young medical men who are considering joining the Indian Medical Service to this aspect. At the same time we see no reason why the increased coöperation of Indian and European medical officers should not, if a sympathetic attitude is adopted, result in the benefit of both. The number of Indians in the I.M.S. in the days of the competitive examination varied from 8 to 12 per cent. In the two or three years before the war the percentage of successful Indian candidates varied from 12 to 30 per cent. At the present time European and Indian candidates are admitted by nomination in the proportion of 2 Europeans to 1 Indian. A strict system of selection is maintained and permanent commissions are only granted to candidates, whether Europeans or Indians, who have been recommended after a personal interview as suitable and desirable professionally and socially. Practically all the Indian candidates recommended so far have served in the field with distinction and have been recommended by two of their brother officers for the grant of a permanent commission.

A Board of Selection has been appointed in India for the recruitment of permanent officers for the I.M S. in the manner indicated, consisting of the Director-General, I.M.S., the Director of Medical Services in India, and an Indian Officer, I M.S. Candidates who may be summoned by the Board for interview will, if considered suitable for appointment, be placed in one of two classes, according as they have or have not received their medical education chiefly in Great Britain. The final recommendations as to the former will be made by the Selection Board in England, while the recommendations as to the latter will be sent direct from India to the Secretary of State, who will make appointments to fill the vacancies. The Selection Committee in England, in addition to considering applications from India of candidates who have mainly received their education in England, will review those of the candidates in the United Kingdom; but not the recommendations of the Indian Committee in regard to candidates educated in that country.

Temporary Commissions.—To meet the present shortage in the cadre of the I.M.S. a special contract is provided for the grant of temporary commissions to European medical officers. The terms of this contract are well worth the consideration of those practitioners who, for private reasons, do not wish to make a definite decision for permanent service in India.

A temporary commission is granted for two years with pay at Rs. 700 per mensem for lieutenants and Rs. 750 for captains. Three years' service as a medical officer with the Home, Colonial, or Indian forces qualify for the higher rate.

A first-class passage to and from India is granted, and a £50 outfit allowance. Leave is granted under ordinary military rules, and if an officer has not been able to take one month's privilege leave for each year of service he may get the balance at the expiration of his term of engagement. Applicants who, at the end of the period of temporary service apply, and, being eligible, are accepted for permanent commissions in the I.M.S., will be allowed to count their temporary service for rank, gratuity, and pension. Under such a contract any young medical officer has a splendid opportunity of seeing the world under very favourable conditions and determining on the spot whether it is to his advantage or otherwise to continue serving in the East as a permanent officer of the Indian Medical Service.

For full particulars intending candidates should apply to the Secretary, Military Department, India Office, Whitehall, London, S.W. 1.

AIR FORCE MEDICAL SERVICE.

THE Royal Air Force Medical Service is now definitely established, and, except for a few points which are still under consideration, the conditions of service have received the sanction of His Majesty's Government. This new Service offers a career for medical men which should prove both attractive and interesting. The rates of pay and allowances are good, and a new field of scientific interest is opened up by the manifold problems which the circumstances of aviation produce. The physical and mental fitness for, and reaction to, the varied conditions under which the flying personnel perform their functions provide much scope for research. As promotion to the higher ranks of the Service is to be entirely by selection, and as a certain proportion of the higher ranks will be reserved for purely scientific, as opposed to administrative, appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in scientific research, as well as for those who develop a talent for administration.

The establishment will consist partly of permanent and partly of short-service officers. Short-service officers will be admitted by direct entry for a period of two years, which may be extended to four years at the discretion of the Air Council on recommendation of the Director of Medical Services. Those who are not selected for permanent commissions will pass into the Royal Air Force Medical Reserve at the expiration of their period of service on the active list, and will then receive gratuity to which their service entitles them.

Short-service officers who are approved for permanent commissions, but for whom there are not vacancies in the Royal Air Force Medical Service, may, under certain conditions, transfer to the Royal Army Medical Corps, counting their time served in the Royal Air Force towards increments of pay and retired pay in the Royal Army Medical Corps. Arrangements are being made to allow post-graduate courses after selection for permanent commission.

New entrants into the Royal Air Force Medical Service will be commissioned as Flying Officers (Medical) and will be eligible for promotion to the rank of Flight Lieutenant (Medical) after two years' service. Officers selected for permanent commissions will be promoted to the rank of Squadron Leader after 10 years' total service. Accelerated promotion may be carried out, in a limited number of cases, of officers who show exceptional ability after the completion of eight years' service. Promotion to the rank of Wing Commander will be by selection at any period after 16 years' total service, and to that of Group Captain by selection at any period after 22 years' service.

There will be no competitive examination on entry; candidates must be under 28 years of age, be nominated by the Dean of a recognised medical school or teaching hospital, and will be interviewed personally by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce—

1. Birth certificate.
2. Medical registration certificate.
3. A declaration containing the following information:—

(*a*) Age and place of birth.

(*b*) That he is of pure European descent, and the son of a subject of the British Empire.

(*c*) That he labours under no constitutional or mental disease or disability which may interfere with the efficient discharge of the duties of a medical officer in any climate in peace or war. (All candidates will be required to pass a medical examination as to their physical fitness before acceptance to ensure that they fulfil the standard laid down in this declaration.)

(*d*) That he is ready to engage for general service at home or abroad as required.

(*e*) The qualifications he is possessed of, and what medical or other appointments he has held (if any).

(*f*) That he is willing to fly whenever called upon to do so, and to qualify in such aviation tests as may be required.

If the applicant is in possession of a certificate of training in an Officers' Training Corps this should be submitted.

An applicant who at the time of application holds or is about to hold, a resident appointment in a recognised civil hospital may be seconded for the period not exceeding one year, during which he holds such appointment. Whilst seconded he will not receive pay from Air Council funds, but his seniority will count from the day on which he is seconded to the civil hospital.

Uniform and Equipment.

Medical officers will be required to provide themselves with the uniform of their rank and with the distinguishing badges of the Royal Air Force Medical Service. Officers accepting four-year short service commissions will be required to provide themselves with service dress and mess dress. For officers accepting two-year commissions mess dress will be optional. (The question of the grant of an outfit allowance to medical and other officers of the Royal Air Force is under consideration.)

Officers on entry are required to provide themselves with the regulation pocket case of instruments.

RATES OF PAY AND RETIRED PAY.

The rates of pay are as given in Table I.:—

TABLE I.

Years of service.	Rank.	Rate per diem.
		s.
On joining	Flying Officer.	24
After 2 years	Flight Lieutenant.	26
,, 4 years	,,	28
,, 6 years	,,	30
On promotion	Squadron Leader.	34
After 2 years in the substantive rank	,,	36
,, 4 ,, ,, ,, ,,	,,	38
,, 6 ,, ,, ,, ,,	,,	42
On promotion	Wing Commander.	46
After 2 years in the substantive rank	,,	50
,, 4 ,, ,, ,, ,,	,,	52
,, 6 ,, ,, ,, ,,	,,	54
On promotion	Group Captain.	60
After 2 years in the substantive rank	,,	64
,, 4 ,, ,, ,, ,,	,,	68

The scale of retired pay for Group Captains and lower ranks is given in Table II.:—

TABLE II.

Age.	Service counting for retired pay.	Rate of retired pay.	Addition for each extra year of service.*	Reduction for each deficient year of service.*
		£	£	£
55	24	790	22	15
54	24	765	22	15
53	23	742	22	15
52	23	720	22	15
51	22	697	22	15
50	22	675	15	15
49	21	637	15	15
48	21	600	15	15
47	20	562	15	15
46	20	525	15	15
45	19	487	15	15
44	19	450	15	15
43	18	412	15	15
42	18	375	15	15
41	17	337	15	15
40	17	300	15	15

* Limited to five years.

Group Captains retire at 55; maximum retired pay £900.
Wing Commanders retire at 51; maximum retired pay £600.
Squadron Leaders retire at 48; maximum retired pay £500.

There will be a minimum qualifying period for retired pay of 20 years.

Gratuities.

Short-service officers will receive gratuities at the rate of £100 for each of the first two completed years of service, and at the rate of £150 for the third and fourth completed year. (If granted permanent commissions these gratuities will not be payable, but the period of service under the short-service commission will count for retired pay.)

Medical officers holding permanent commissions may, at the discretion of the Air Council, be allowed to withdraw from the Service after ten years' service with a gratuity of £1250 or after 16 years with a gratuity of £2000 in lieu of retired pay.

Allowances.

The usual allowances will be payable to medical officers under the same conditions as to officers of other branches of the Royal Air Force.

THE COLONIAL MEDICAL SERVICE.

IN the self-governing dominions, Canada, Australia, New Zealand, the Union of South Africa, and Newfoundland, medical appointments are made concerning which information can be obtained from the High Commissioners or Agents-General in London; appointments in Egypt and the Soudan are regulated from the Foreign Office; in Aden and adjacent territories the appointments are under the control of the Government of Bombay; in Rhodesia the appointments are made by the British South Africa Company, London Wall Buildings, E.C.; in North Borneo application should be made to the British North Borneo Company, 37, Threadneedle-street, E.C., for appointments; and those in Sarawak are in the hands of H.H. the Rajah.

But in addition to all these there are a large number of important posts under the patronage of the Secretary of State for the Colonies. These concern East Africa (the East Africa, Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates); Eastern (Ceylon, the Straits Settlements, and Federated Malay States, Hong-Kong, Weihaiwei, Mauritius, and Seychelles); West India (British Guiana, Jamaica, Trinidad, the Windward Islands, the Leeward Islands, Barbados, British Honduras, and the Bahamas); Fiji and the Western Pacific, Cyprus, Malta, Gibraltar, St. Helena, Bermuda, and the Falkland Islands; and West Africa (Nigeria, the Gold Coast, Sierra Leone, and the Gambia). As a general rule, each Colony or Protectorate has its own public service distinct from that of every other, and it is usually only the higher officers who are transferred by the Secretary of State from one Colony to another; but there are two exceptions to this rule. The West African Medical Staff, which serves Nigeria, the Gold Coast, Sierra Leone, and the Gambia, form one service, and in practice the medical services of the Straits Settlements and the Federated Malay States may be regarded as one, as the officers may be and frequently are transferred from the Colony to the States, or *vice versa*. In Ceylon, Mauritius, Jamaica, Barbados, the Bahamas, and Bermuda vacancies are almost always filled locally by the appointment of qualified native candidates, or—in the case of some of the higher posts—by transfer from other Colonies. Appointments in Malta are all filled locally. Vacancies in the Hong-Kong Medical Department are generally filled by transfer from other Colonies Medical appointments in the Bechuanaland Protectorate, Basutoland, and Swaziland are made only on the recommendation of the High Commissioner for South Africa, who usually appoints local candidates. In most cases the duties of a colonial medical officer are of a very general character, including medical, surgical, and often public health work. It is only occasionally that a specialist is required.

Applicants must be between the ages of 23 and 35 and doubly qualified, and the choice will usually fall on those who have held hospital appointments. Before being definitely appointed candidates will be medically examined by one of the consulting physicians of the Colonial Office: Sir J. Rose Bradford, K.C.M.G., 8, Manchester-square, London, W.; Sir J. Hawtrey Benson, 57, Fitzwilliam-square, Dublin; Lieutenant Colonel J. Arnott, I.M.S., 8, Rothesay-place, Edinburgh; and W. T. Prout, Esq., C.M.G., 14, Rodney-street, Liverpool.

East Africa.—There are now vacancies for Medical Officers and Medical Officers of Health in East Africa. It is usual to select Medical Officers of Health from among officers already serving as Medical Officers, and in the wording of the regulations the term "Medical Officers" covers "Medical Officers of Health," save where the context indicates otherwise. Medical Officers selected for appointment to East Africa are allocated to one of the following administrations:—Kenya Colony and Protectorate, Nyasaland Protectorate, Somaliland Protectorate, Tanganyika Territory (late German East Africa), Uganda Protectorate Zanzibar Protectorate. Whenever possible, a successful candidate is allocated to the Administration for which he expresses a preference. The conditions of service are here summarised: Appointments held by Medical Officers are on the permanent and pensionable establishment. Medical Officers serve for 3 years on probation, and leave is granted with full pay after every tour of service, the length of a tour being normally 30 months in East Africa. If an officer is not returning for further duty the leave for which he is eligible is the period of the voyage home and 2½ days in England for every month of service; if returning for further duty, the leave for which he is eligible is the period of the voyage home and back to East Africa and 5 days in England for every month of service in East Africa, but at certain stations service qualifies for leave at 3 and 6 days instead of 2½ and 5 days respectively. A free first-class passage is provided by the Government on first appointment and on leave. Quarters (with furniture) are provided free of rent, or if quarters are not available, an allowance is given in lieu. Travelling allowance is paid to officers travelling on duty in East Africa in accordance with local regulations. Private practice is permitted subject to the proviso that it must not interfere with the officer's Government work, but this privilege is not granted to Medical Officers of Health. An Officer is eligible to retire on pension at the age of 50. Pension is calculated on the basis of 1/60th of pensionable emoluments at the date of retirement (i.e., salary and the value of free quarters) for each year of service, 2 years of service being reckoned for this purpose as *three* years. Medical Officers may, however, retire with gratuity, if they wish, instead of waiting to retire at the retiring age on pension. The gratuity is: After 9 years' service, of which not less than 6 years must be resident service in East Africa, £1000; after 12 years' service, of which not less than 8 years must be resident service in East Africa, £1250. Prior to appointment, candidates are required to attend a course of instruction in tropical medicine at the London or Liverpool School of Tropical Medicine; if this cannot be arranged, such a course must be taken during the first leave, before a Medical Officer can be confirmed in his appointment. Details of payments made by the Government in respect of these courses are supplied when a candidate has been provisionally selected. The Grades and Salary of the Medical Establishments are as follows:—East Africa Protectorate and Tanganyika Territory and Uganda Protectorate: Principal Medical Officer, £1200; Deputy Principal Medical Officer; £1000; Principal Sanitation Officer, £1000; Senior Medical Officers, Sanitation Officers, £700–£25–£800; Medical Officers and Medical Officers of Health, £600–£25–£700. Nyasaland Protectorate: Principal Medical Officer, £1000; Senior Medical Officer, Sanitation Officer, £700–£25–£800; Medical Officers and Medical Officers of Health, £600–£25–£700. Somaliland Protectorate: Senior Medical Officer, £600–£25–£750 (£60 duty pay); Medical Officers and Medical Officers of Health, £500–£25–£700. Zanzibar Protectorate: Principal Medical Officer, £1000; Sanitation Officer, £700–£25–£800; Medical Officers and Medical Officers of Health, £600–£25–£700. All Medical Officers of Health receive a special non-pensionable allowance of £100 or £50 per annum according to their station in the Protectorates.

Straits Settlements and Federated Malay States.—The services of 33 Medical Officers are required here, the salary offered being $440 a month for the first year, $460 for the second, and $480 for the third year. In all cases the appointments are on probation for the first three years; after which Medical Officers may be placed on the permanent and pensionable establishment. Subject to passing a strict efficiency bar before rising above $600 per month, salaries will thenceforward be at the rate of $500 a month rising by annual increments of $25 a month to $800 a month. Promotion to posts above this maximum will be by selection. Officers having specialist qualifications of an approved type will enter the scale of salary at $550, rising by $25 a year to $600 per month during the first three years; after which, if their appointments are made permanent and they pass the efficiency test, their salary will rise, as in other cases to $800 a month. No duty allowance is paid. There is at present a strictly temporary increase to meet the increased cost of living; (*a*) 20 per cent on salaries under $600; $120 on salaries over $600; (*b*) a married allowance for married officers of 20 per cent., with a maximum of $160. The exchange value of the dollar is fixed by Government at 2*s*. 4*d*. This rate is liable to alteration but has remained constant for the past 14 years, and, so far as can be at present forseen, no change is anticipated. Candidates must be graduates of one of the British Universities, or hold the qualifications of the College of Surgeons and Physicians of London, Edinburgh, or Ireland, and in some cases a diploma in Public Health. If they have not already done so, they will be required to attend a course of instruction at the London or Liverpool Schools of Tropical Medicine, either before embarkation or during their first leave of absence in Europe. Their whole time will be at the disposal of the Government, and no private practice is allowed. The duties will be generally to take charge of one of the hospitals in the Malay Peninsula, and any other duties on which in the public interest it may be desirable to employ them. Free passages (second class by mail or first class by other vessel) are given, with half salary from date of embarkation. Candidates of over 37 years of age will not be considered for appointment on the above terms. They may, however, be engaged on three years' agreement, renewable by consent of both parties, with salaries commencing at $600 to $700 a month (according to qualifications), and rising annually by $25 a month. Such appointments will not be pensionable and no prospect can be held out of promotion to the highest posts in the Medical Service. A bonus of two months salary, however, will be payable for each completed year's service on termination of agreement or extended agreement.

Seychelles.—There are four medical appointments. The Assistant Government Medical Officers receive Rs 5000. The holders of these appointments have free quarters. Private practice is allowed.

Weihaiwei.—There are two non-pensionable Medical Officers on salaries £400–£25–£500, with free quarters.

British Guiana.—The prospects of promotion in this Service are considerable. There are 3 posts at £400–£500, 17 posts at £500–£600, and 14 posts at £600–£700 per annum. There are several public hospitals and asylums; medical officers attached to these institutions receive plainly furnished bachelor quarters and an allowance in lieu of private practice. There are also many posts as resident surgeons in charge of districts. In these cases a travelling allowance is granted, and in some instances also a free house There are four vacancies for Assistant Government Medical Officers at present, the appointments there being temporary for two years, at the end of which period the holders will be permanently appointed if their service has been satisfactory. The salary is £400, rising by annual increments of £25 to £500. A first-class passage to the colony is provided. Vacation leave of absence on full pay not exceeding three months may be granted by the Governor during and in respect of any two consecutive years' service. Subject to the necessities of the Service, leave of absence on half pay may be granted without any special grounds after six years' resident service from first appointment in the colony, and on special grounds at an earlier date.

Trinidad and Tobago.—In Trinidad and Tobago there are over 40 appointments. Officers are appointed in the first instance on two years' probation as supernumeraries and are eligible for appointment as Government Medical Officers at the end of this period. Applicants

must be unmarried and must remain unmarried whilst supernumerary Medical Officers. Supernumeraries receive a salary of £250 per annum with furnished quarters, and are usually attached to the Government hospital. Government Medical Officers receive salary at the rate of £250 per annum with quinquennial increments of £50 accruing from the date of first appointment as supernumerary Medical Officers. Most are employed as District Medical Officers, with private practice, a residence or a rent allowance of £50, a horse allowance, except in one district, and in some cases other allowances for institution work. All officers are required to contribute 4 per cent. of their salaries towards the pensions of the widows and orphans of public officers.

Windward Islands (Grenada, St. Lucia, St. Vincent).—The 25 appointments are, with few exceptions, district appointments with the right to private practice attached; the salaries paid by Government vary from £250 to £550, with allowances in certain cases. The Governor has the power to transfer a medical officer from one island to another at his discretion. The appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The 24 appointments are of the same nature as in the Windward Islands, but are not pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary of £250 or £300 according to station, and the Governor decides as to the district which is to be allotted to him. He is liable to be transferred to any medical district in the Islands, and in certain districts he may be required to perform magisterial duties. The medical officers receive fees for successful vaccinations, post-mortem examinations, attendance and giving evidence at courts of justice, certificates of lunacy, and, in the larger islands, for burial certificates. They are also, as a rule, allowed private practice.

British Honduras.—There are seven medical appointments (besides the principal post of Colonial Surgeon) each carrying a salary of $1701 per annum. Unless they already possess a Diploma of Public Health, medical officers are liable to be required before they join the colony to undergo a course of instruction at a laboratory of public health or analogous institution. The dollar = about 4*s.* 2*d.*

Fiji and the Western Pacific.—In Fiji the Government Medical Officers receive a salary of £400, rising by annual increments of £25 to £500, with partly furnished quarters, or a house allowance of £50. In some districts a medical officer is also a magistrate with a combined salary of £500, rising to £600, with free quarters. They are allowed private practice, so far as is consistent with the proper discharge of their duty to the Government, but in most districts the private practice is very small. In districts where there is no private practice, an allowance of £50 a year is granted. They are required either to take charge of hospitals or of districts, at the discretion of the authorities. The posts are pensionable. There are at present 18 Medical Officers, three of whom are also Magistrates, in addition to a Chief Medical Officer (£700 a year, rising to £800), a Medical Officer of Health (£500, rising to £600), and a Senior Medical Officer (£450–£500). The medical services of Fiji and the Western Pacific are interchangeable. While serving in the Western Pacific Protectorates their duties may be of a quasi-magisterial nature, and they draw an extra non-pensionable allowance of £50 per annum.

Cyprus.—There is a Chief Medical Officer paid at the rate of £550 per annum, and three District Medical Officers paid at the rate of £450 per annum, all enjoying private practice (except the Chief Medical Officer, who is allowed consulting practice only) and receiving 2*s.* per diem forage allowance; these are the only medical appointments in the island which are open to English candidates.

Gibraltar.—There is a surgeon of the Colonial Hospital receiving £400 with fuel and light allowances, and private practice. He also receives £50 for medical examination of school children. There are also two Assistant Surgeons with a salary of £350 per annum, who are allowed private consulting practice only. Free quarters, unfurnished, are provided for all three officers.

St. Helena.—The Colonial Surgeon at present receives £270 per annum, £20 fees as Health Officer, and £27 horse allowance. Private practice is allowed. The Assistant Colonial Surgeon receives £350 a year and a horse, with forage allowance; but no private practice is allowed without special permission.

Falkland Islands.—There are two appointments. The Colonial Surgeon is paid at the rate of £350 per annum, with £25 as Health Officer. The Assistant Colonial Surgeon is paid at the rate of £400 per annum without quarters. Part of the salary is provided from private sources. Private practice is allowed to the Colonial Surgeon, and to a lesser extent to the Assistant Colonial Surgeon.

Leave and Passages.—In the East African Protectorates leave of absence on full salary is granted in the normal case after a tour of residential service (of not less than 20 nor more than 30 months) to an amount of five days for each completed month of residence (or 2½ days when for any reason the officer is not returning to East Africa) exclusive of the periods of the voyages to and fro. Officers serving in Uganda, Zanzibar, or in certain stations in the East Africa and Nyasaland Protectorates are allowed six or three days' leave respectively in respect of each month of service. In Somaliland special leave regulations exist which provide for an officer taking leave approximately every year. Free first-class passages are provided for the officer only. In the Malay Peninsula two months' leave of absence with full salary may be granted in respect of each year's service, and this leave may be accumulated up to a maximum of eight months. Additional leave on half pay may be granted on special grounds. If an officer on the occasion of his first leave is in receipt of a pensionable salary of less than £500 a year, he is granted a free return passage to the United Kingdom. In Hong-Kong leave of absence on half salary may be granted after 4½ years' service, and a portion of such leave may be commuted, if the Governor agrees, for half the amount on full pay. Leave of absence in excess of 10 months at a time will not be granted, but an extension may be allowed for ill-health or very urgent private affairs.

Subject to the necessities of the service, leave of absence on half salary may be granted to officers in other Colonies outside tropical Africa after a period of six years' resident service without any special grounds. Officers of the Fiji and Western Pacific service proposing to spend their leave in Europe may receive a grant in aid of passage expenses of £60. Leave may be given before the expiration of the due period in case of serious indisposition, or of urgent private affairs. In the absence of special grounds, the leave must not exceed one-sixth of the officer's resident service; on special grounds it may exceed that period by six months. In addition to the above, vacation leave on full pay may be granted, if no inconvenience or expense is caused thereby, not exceeding three months in any two years. In the case of Fiji and the Western Pacific and the Falkland Islands, 4½ months' leave may be granted in any three years.

On first appointment an officer whose salary and fees together do not exceed £500 a year will, except in the case of a few Colonies possessing Representative Assemblies, be provided by the Crown Agents for the Colonies with free passages to the Colony for himself and his wife and children, if any, not exceeding four persons besides himself. The officer so appointed will be required to execute an agreement binding him to repay the cost of the passage or passages so obtained in the event of his leaving the Government service within three years. This rule applies also to officers appointed to the Malay Peninsula and Hong-Kong. An officer taking leave out of the Colony has to provide his own passages.

Pensions.—Officers on the pensionable establishment in the East African Protectorates are at liberty to retire on attaining the age of 50 years. Earlier retirement in the event of ill-health is also provided for. Pensions are computed on the scale of one-sixtieth of the average annual salary of the retiring officer's fixed appointments for three years prior to retirement, but for purposes of calculating pensions two years' service is reckoned as service for three years. In most of the other Colonies an officer holding a pensionable appointment may be allowed in the case of ill-health to retire on a pension after ten full years' resident service; otherwise he must have attained the age of 55. For ten full years' resident service fifteen-sixtieths of the average annual salary of the retiring officer's fixed appointments for three years prior to retirement may be awarded, to which one-sixtieth may be added for each additional year's service; but no addition will be made in respect of any service beyond 35 years. For pension purposes absence on vacation leave counts as full service, and leave on half pay as half service. In a few cases the retiring age is 60, and the pension after ten years' service is ten-sixtieths instead of fifteen.

Applications should be made in writing to the Private Secretary (Appointments), Colonial Office, Downing street, London, S.W. 1.

West African Medical Staff.

The medical services of the West African Colonies and Protectorates—namely, the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria—form one service under the above name. All the medical officers for the service are selected by the Secretary of State for the Colonies, and are on one list for employment and promotion. As in other Colonies, applicants must be between 23 and 35 years of age and possess a double qualification, but preference is given to those over 26. The higher grades are usually filled by promotion from the lower. Camp outfit must be taken out by every medical officer, and an allowance of £30 is given towards its purchase on appointment.

The grades and emoluments of officers of the staff are as follows:—

The Director of the Medical and Sanitary Service in Nigeria receives a salary of £1700 a year, with a duty allowance at the rate of £340 a year.

Principal Medical Officer: The Principal Medical Officers receive salaries as follows: In the Gold Coast and the Southern Provinces of Nigeria £1500 a year, with a duty allowance at the rate of £300 a year. In Nigeria (Northern Provinces), £1500 a year, with a duty allowance at the rate of £300 a year. In Sierra Leone, £1350 a year, with a duty allowance at the rate of £270 a year. There is no Principal Medical Officer in the Gambia.

Deputy Principal Medical Officer: There are four appointments of this grade, two in the Southern Provinces of Nigeria and one each in the Northern Provinces and in the Gold Coast respectively. Salary at the rate of £1300 a year is attached to these appointments, together with a duty allowance at the rate of £260 a year.

Senior Sanitary Officer: There are four appointments of this grade, two in Nigeria, one in the Gold Coast, and one in Sierra Leone. Salary at the rate of £1300 a year is attached to these appointments, together with a duty allowance at the rate of £260 a year.

Provincial Medical Officer: There are seven appointments bearing this title (four in Nigeria, two in the Gold Coast, and one in Sierra Leone), with salary at the rate of £1200 a year, and duty allowance at the rate of £240 a year.

Senior Medical Officer: There are 20 appointments of this grade, with salary at the rate of £1000 a year, rising by annual increments of £50 to £1150 a year, and proficiency pay of £100 a year. The Senior Medical Officer of the Gambia draws staff pay at the rate of £120 a year, in addition to duty pay, but is not allowed private practice.

Sanitary Officer: There are seven appointments of this grade, with salary at the rate of £1050 a year, rising by annual increments of £50 to £1200 a year, and a duty allowance at the rate of £210 a year.

Medical Officer: The salary is at the rate of £660 a year, rising by annual increments of £30 to £720; and then by £40 to £960, with proficiency pay of £72 a year. Before passing £800 Medical Officers are required to take a special course of study for three months; if satisfactory they then continue to draw increments up to £960. A Medical Officer who has served for three years on the maximum of this scale (£960) is eligible to be placed on the same scale of salary as a Senior Medical Officer.

Special appointments: The Director of the Medical Research Institute, Lagos, and the Pathologist, Accra, receive a salary of £1300 a year, with a duty allowance of £260 a year. Salary at the rate of £800, rising by annual increments of £40 to £960 a year, with a proficiency pay of £72 a year, is attached to about ten posts (those of Assistant at the Medical Research Institute, Lagos, and Medical Officers of Health at various places), irrespective of the seniority of the officer holding the appointment. Staff pay at the rate of £150 a year is also attached to these posts; and the holder of the appointment draws half of the staff pay during leave of absence, the remainder being drawn by his locum tenens.

Leave and Passages.—The ordinary tour of residential service is one year, followed by leave with full pay during the voyages to and from England, and for four or two months clear in England, according as the officer is returning for further service in West Africa or not. If an officer is detained beyond the year, additional leave is given with full pay for ten days in respect of each completed month beyond twelve, whether he is returning or not. If he is invalided before the end of the

year, the leave with full pay is for the voyages and for ten or five days in respect of each completed month, according as he is returning or not. Leave granted on the understanding that an officer will return is known as "return leave," and any pay drawn in respect of such leave is liable to be refunded if he does not return. Leave may be extended with half pay for a period not exceeding four months on the ground of ill-health, or without pay on that or other grounds. Free passages are given to all officers who are granted leave, and free passage is also given on first appointment, subject to the officer signing an agreement under which he is liable to refund its cost if he relinquishes his appointment for any other reason than physical or mental infirmity, or is removed for misconduct, within three years from the date of his arrival in West Africa. Half pay is given during the voyage out on first appointment.

Private Practice.—All officers of the Staff, except Principal Medical Officers, Deputy Principal Medical Officers, Provincial Medical Officers, Sanitary Officers, and a few other officers holding special appointments, are at present allowed to take private practice, provided that it does not interfere with the efficient performance of their official duties, but it is within the power of the Governor to withdraw or suspend the privilege in such places and for such periods as he may consider desirable. Private practice does not exist at the majority of stations, and as a general rule, subject to the exigencies of the service, stations where there is private practice are allocated to senior members of the staff.

Pensions and Gratuities.—These vary in accordance with the regulations of each Colony, but generally speaking an officer on attaining the age of 50 years, or after 18 years' service (of which at least 12 must have been residential) is qualified for a pension calculated at one-fortieth of the last annual[1] salary for each year of service. If invalided after a minimum of seven years' service, he is qualified for a pension calculated at the same rate. If invalided before completing seven years' service, he is qualified for a gratuity not exceeding three-quarters of a month's salary for each six months of service; provided that he has been confirmed in his appointment. For the purpose of calculating the amount of these pensions and gratuities, leave of absence without salary is not counted, while leave with half salary is counted at the rate of one month for every two months of such leave. An addition, representing the value of free quarters, is made to the officer's salary. This addition is as follows: To salaries of £400 a year, an addition of £40; to salaries above £400, but not exceeding £500, an addition of £50; to salaries above £500, but not exceeding £700, an addition of £60; to salaries above £700, but not exceeding £900, an addition of £70; to salaries exceeding £900, an addition of £80. In addition to the ordinary regulations, an officer of the West African Medical Staff enjoys the following special privilege. At the end of nine years (of which not less than six must have been residential) he will be permitted to retire with a gratuity of £1000, or at the end of 12 years (of which not less than eight must have been residential) with a gratuity of £1250. All claims to pensions are, however, forfeited on the receipt of such a gratuity. In the event of an officer dying in the service after completing the period of residence qualifying him for the smaller or the larger of these gratuities, a sum equal to the gratuity in question will be paid to the credit of his estate. Officers are not allowed to take their wives out with them until they have acquired experience of the local conditions, and have obtained the sanction of the Governor. Passages for wives and children are not provided.

Candidates for medical appointments in West Africa are allowed to express a preference for any particular Colony or Protectorate, and their wishes in this respect will be borne in mind and met as far as possible, but they are liable to be posted in the first instance, or transferred afterwards if necessary, to any other West African Colony or Protectorate at the discretion of the Secretary of State. Candidates who wish to be posted to the Northern Provinces of Nigeria should be able to ride. Candidates should on no account apply for, or accept, a West African appointment in the expectation of ultimately being transferred elsewhere, as the number of such transfers is exceedingly small. No applications for transfer can be entertained until an officer has served for five years in the West African Medical Staff, and officers desiring to be transferred must be prepared to find that medical salaries in other Colonies are lower than in West Africa. Only a small proportion of applicants succeed in obtaining a transfer. Officers who may be transferred to pensionable appointments under the Crown elsewhere than in West Africa do not forfeit their claim to pension in respect of their West African service on final retirement, provided they have been members of the Staff for at least 12 months.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be required to undergo a course of instruction for two or three months either at the London School of Tropical Medicine, Endsleigh-gardens, Euston-square, N.W. 1, or at the Liverpool School of Tropical Medicine at the University of Liverpool. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for board and lodging; an allowance of £3 a week will be paid to them monthly in arrear for this purpose. A daily allowance of 5s. (but no salary) will be paid to each candidate, monthly in arrear, during the course, and may be continued subsequently up to the date of embarkation. These payments must be refunded by the candidate if he declines to accept an appointment in any of the Colonies or Protectorates for which he may be selected, if he fails to obtain a certificate showing that he has satisfied the school authorities, or if he relinquishes the West African service for any other reason than mental or physical infirmity, or is removed for misconduct, within three years of the date of his arrival in West Africa. If at the end of the session there exist no vacancy in the staff to which a candidate can be appointed, he will be placed in a Reserve and granted an allowance at the rate of £200 a year until the occurrence of a vacancy.

Course of study for higher scale of salary.—The approved course of study is the three months' course of the West London Post-Graduate College or the London School of Clinical Medicine, Greenwich, in clinical medicine, clinical surgery, and pathology. Officers are allowed to substitute for this course either the course of study and examination for a recognised diploma or degree in public health, sanitary science, or State medicine; the course of study and examination for a further medical or surgical diploma or degree; or if the Governor, on the recommendation of the Principal Medical Officer, approves—a course of study in some special branch of medical or surgical practice (e.g., ophthalmology, dermatology, genito-urinary diseases), or an advanced course at the London or Liverpool School of Tropical Medicine. Whichever of these courses of study is selected, the necessary tuition and examination fees will be paid by the Colonial Government except in the event of an officer's deciding to enter for a further medical or surgical diploma or degree.

[1] Except that the pension of an officer who has been promoted within three years of his retirement is calculated on the average of his salary for the last three years.

In conclusion it should be added that owing to the wastage of war and the lapse of periods of service there are at the present time many vacancies in the Colonial service, and that the age limits laid down for Colonial appointments are not always insisted upon, while in a number of cases a temporary war bonus augments the salary. It should be noted, too, that there is some possibility that in the near future opportunities may be given to Colonial officers for research work, thus bringing this branch of public medical service more in line with the opportunities offered to the military and naval services.

DIPLOMAS IN STATE AND TROPICAL MEDICINE.

As usual we include in the Students' Number of THE LANCET an epitome of the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, State medicine, and tropical medicine.

Resolutions, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health," have been adopted at various times by the General Medical Council from 1902 to 1911. Certain universities and corporations grant qualifications in Tropical Medicine which have not as yet been made registrable by statute.

University of Oxford.—An examination, conducted partly in writing, partly *vivâ voce*, and in each subject partly practical, is held in Michaelmas and Trinity Term in the following subjects:—General Hygiene, General Pathology (with special relation to Infectious Diseases), the Laws relating to Public Health, Sanitary Engineering, Vital Statistics. The examination is in two parts, which may be taken together or separately; but Part I. must be passed either before or at the same examination as Part II. The fee for admission to the examination is £5 for each part. Successful candidates are entitled to receive the Diploma in Public Health.

The First Part of the examination will comprise (*a*) a written paper of three hours in Chemistry and Physics; (*b*) a three hours' practical and *vivâ voce* examination in Chemistry and Physics.

The Second Part of the examination will consist of the following parts:—(*a*) Two written papers, each of three hours, dealing with General Hygiene (including Sanitary Engineering, Vital Statistics, and the Laws relating to Public Health); (*b*) a practical and *vivâ voce* examination in General Hygiene; (*c*) a written paper of three hours in Pathology and Bacteriology; and (*d*) a three hours' practical and *vivâ voce* examination in Pathology and Bacteriology.

Candidates in Part I. of the examination will be required to produce a certificate (1) of Laboratory Work in Chemistry as applied to Hygiene.

Candidates in Part II. will produce the following further certificates: (2) of a Practical Knowledge of the Duties, Routine and Special, of Public Health Administration; (3) of having had Practical Instruction in Bacteriology, and the Pathology of the Diseases of Animals transmissible to Man; and (4) of having attended the practice of a Hospital for Infectious Diseases at which opportunities are afforded for the study of the Methods of Administration. All the above degrees are now open to Women Students, and particulars of Scholarships, &c., may be obtained from the Principals of the various Ladies' Colleges. The names of candidates must be sent to the Assistant Registrar of the University, Clarendon Building, Oxford, to whom applications for any further information should be addressed.

University of Cambridge.—Two examinations in so much of State medicine as comprised in the functions of medical officers of health are held during the year. The examination is divided into two parts and demands proficiency in all the branches of study which bear upon the duties of medical officers of health The examinations in both parts will be oral and practical, as well as in writing. Candidates may present themselves for either part separately or for both together at their option; but the result of the examination in the case of any candidate will not be published until he has satisfied the examiners in both parts. Marks of distinction will be placed against the names of candidates who have specially distinguished themselves in either (1) general principles of hygiene; (2) bacteriology; (3) chemistry in Part I. of the examination; or (4) the second part of the examination, which has reference to State Medicine and to the applications of Pathology and Sanitary Science. Every candidate will be required to pay a fee of £6 6*s*. before admission or readmission to *either part* of the examination, but candidates who have presented themselves before the year 1896 will be readmitted to either part on payment of a fee of £5 5*s*. Candidates must before admission to either part of the examination produce evidence of having satisfied provisions (1), (2), and (3), and before admission to Part II. having satisfied provision (4), above mentioned.

For Part I. of the examination courses of lectures and laboratory instruction are given in the University by Mr. J. E. Purvis on Hygiene, Chemistry, &c., and by Dr. Graham-Smith on Bacteriology. Professor G. H. F. Nuttall gives a course of lectures on Protozoal Diseases, and Dr. A. E. Shipley on Animal Parasites. For Part II. Dr. A. J. Laird, the Medical Officer of Health for Cambridge, gives courses on Practical Sanitary Administration and in the Administrative Methods of the Infectious Diseases Hospital, and Dr. F. Robinson, the Medical Officer of Health to the Cambridgeshire County Council, on Sanitary Laws, School Hygiene, Epidemiology, Vital Statistics, &c. These courses are open to non-members of the University.

All applications for further information respecting examinations and the courses of study should be addressed to Mr. Purvis, Chemical Laboratory, Pembroke-street, Cambridge.

Two Examinations in Tropical Medicine and Hygiene are conducted yearly by the State Medicine Syndicate of the University of Cambridge. The examinations are held in Cambridge early in January and in the middle of August. Each examination will extend over four days.

Any person whose name is on the Medical Register is admissible as a candidate to the examination provided (I.) that a period of not less than 12 months have elapsed between his attainment of a registrable qualification and his admission to the examination; (II.) that he produce evidence, satisfactory to the Syndicate, that he has diligently studied Pathology (including parasitology and bacteriology) in relation to Tropical Diseases, Clinical Medicine, and Surgery at a Hospital for Tropical Diseases, and Hygiene and Methods of Sanitation applicable to Tropical Climates. As evidence of study and attainments a candidate may present to the Syndicate (1) any dissertation, memoir, or other record of work carried out by himself on a subject connected with Tropical Medicine or Hygiene; (2) any Certificate or Diploma in Public Health or Sanitary Science he may have obtained from a recognised Examining Body. Such evidence will be considered by the Syndicate in determining whether he is qualified for admission to the examination and by the examiners in determining whether, if admitted, he shall be included in the list of successful candidates.

The examination will be partly in writing, partly oral, and partly practical and clinical (the clinical part will be conducted at a hospital for tropical diseases, at which cases will be submitted for diagnosis and comment), and will have reference to the nature, incidence, prevention, and treatment of the epidemic and other diseases prevalent in tropical countries. Every candidate who passes the examination to the satisfaction of the examiners will receive from the University a diploma testifying to his knowledge and skill in tropical medicine and hygiene.

The fee for the examination is £9 9*s*., and applications should be addressed to Dr. Graham-Smith, Medical Schools, Cambridge.

University of London.—Candidates for the M.D. degree may offer State medicine as a subject in which to graduate. They must send to the Academic Registrar with their forms of entry certificates (i.) of having, subsequently to having obtained a registrable qualification to practise Medicine, attended a course of practical instruction in a laboratory or laboratories, British or foreign, approved by the University, in which chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man are taught; such course to extend over a period of not less than six months and to consist of at least 240 hours, of which not more than one-half shall be devoted to practical chemistry. (ii.) *Either* of having, subsequently to having obtained a registrable qualification to practise Medicine, during six months (of which at least three months shall be distinct and separate from the above-mentioned period of laboratory instruction) been diligently engaged on not less than 60 working days in acquiring a practical knowledge of the duties, routine and special, of Public Health Administration under the supervision of a person recognised by the University as entitled to grant certificates. *Or* of having held for a period of not less than three years an appointment as Medical Officer of Health of a Sanitary District within the British Dominions, and having a population of not less than 15,000. (iii.) Of having, subsequently to having obtained a registrable qualification to practise Medicine, attended at least twice weekly during a period of not less than three months a practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. In connexion with this degree the various metropolitan medical schools hold regular classes under teachers of Public Health and Sanitary Science, such instruction being also used to obtain the various diplomas of other Universities and of those Royal Corporations which grant them.

University of Durham.—Candidates for the degree of Bachelor of Hygiene (B.Hy.) must be at least 22 years of age, registered, and a graduate in Medicine of a recognised university. They must spend six months at Newcastle-upon-Tyne studying Comparative Pathology, Practical Bacteriology, Sanitary Chemistry, and Physics, and have to pass an examination in Sanitary Chemistry, Physics, Comparative Pathology, Sanitary Legislation, Vital Statistics, Nosology, Climatology, Meteorology, Distribution of Health and Disease, Sanitary Medicine and Practical Hygiene. The fee for the examination for the degree of B Hy. is £10 10*s*. and for the degree £6 6*s*. Candidates for the degree of Doctor of Hygiene (D.Hy.) must have acquired the degree of Bachelor of Hygiene, must for two years subsequently have been engaged in Public Health administration, or in research work relating to Public Health. The fee for the examination for the degree of D.Hy. is £5 and for the degree £10. The regulations for examination for the Diploma in Public Health (D.P.H.) are the same as those for the degree of Bachelor of Hygiene, except that the candidate is not required to be a graduate in Medicine of a recognised University and the course of study need not be passed at Newcastle-upon-Tyne. The fee for the examination is £10 10*s*. and for the diploma £3.

Victoria University of Manchester.—An examination in Public Health is held twice yearly. The examination is in two parts and is written, oral, and practical. Candidates may present themselves for Parts I. and II. separately or at the same time provided that no candidate be admitted to Part II. unless he has already passed in Part I. No candidate's name will be published until he has satisfied the examiners in both parts of the examination. The fee for each part is £5 5*s*., and must be paid on or before July 1st in each year. For any subsequent examination in the same part the fee will be £3 3*s*. Every candidate who has passed both parts of the examination to the satisfaction of the examiners, and who is legally registered, will receive a Diploma in Public Health. The examinations will begin about the end of March and the middle of July in each year. Holders of the Diploma in Public Health are eligible for examination for the Certificates in School Hygiene and Factory Hygiene after attending the prescribed periods of study and hospital practice.

University of Birmingham.—The University grants a degree of B.Sc. in Public Health and also a Diploma in the

same subject on the following conditions: Graduates in Medicine of this University may become candidates for the degree of Bachelor of Science in Public Health by conforming to all the requirements laid down for candidates for the Diploma in Public Health, except that after graduating in Medicine all courses of study must be taken out in the University, and they must, in addition, have attended a three months' course of Geology in the University. The examinations will be held in the months of March and June and will consist of two parts, each part being written, oral, and practical. No candidate will be allowed to pass Part II. until he has passed Part I. Candidates may enter for Parts I. and II. separately or at the same time. The fee for each part of the examination is £5. Medical Officers of the Royal Navy who have attended courses in Hygienic Chemistry, Bacteriology, and Public Health at the Naval Medical School, Greenwich, will be admitted to the examinations for the Diploma in Public Health, whether they have previously been students at the Birmingham School or not; and the same applies to officers of the Royal Army Medical Corps who have studied Chemistry and Bacteriology at the Staff College and pursued the further course of study approved by the General Medical Council.

University of Liverpool.—The University grants a Degree in Hygiene (M.H.) and a Diploma (D.P.H.), and every facility is afforded for training in Sanitary Science and State Medicine. The curriculum for the Degree extends over a period of two years, the first of which is devoted to laboratory instruction and practical classes (including those for the Diploma); the second being devoted to advanced study and research. The D.P.H. curriculum fees are: Chemistry, £5 5*s.*; Bacteriology, £5 5*s.*; Practical Sanitation, £15; Infectious Diseases, £3 3*s.* The courses may be taken out at any time, and students are allowed to work daily in the laboratories.

The University grants a Diploma in Tropical Medicine. Three courses of instruction are given every year. Two of these last for three full months—the Lent Course from Jan. 6th to April 5th and the Autumn Course from Sept. 15th to Dec. 13th. The Third Course, an Advanced Course, lasts one month, from June 1st to the 30th. At the end of each full course an examination is held by the University for its Diploma of Tropical Medicine (D.T.M.), which is open only to those who have been through the course of instruction of the school. The examination lasts three days and consists (1) of papers on Tropical Medicine, Tropical Pathology, and Tropical Sanitation and Entomology respectively; (2) of a clinical examination; and (3) of an oral examination. The advanced course consists entirely of Practical and Clinical Laboratory Work, given at the laboratory at the University. The fee for the full course of instruction is 13 guineas, with an extra charge of 10*s.* 6*d.* for the use of a microscope if required. The fee for the examination is 5 guineas. Applications should be made to the Dean of the Medical Faculty, University of Liverpool. Two University Fellowships of £100 a year each are open to students of the school, amongst others. Accommodation for research work is to be had at the University Laboratory. The Mary Kingsley Medal is awarded by the school for distinguished work in connexion with Tropical Medicine.

University of Leeds.—The University grants a Diploma in Public Health, and every facility is afforded for training in Sanitary Science and State Medicine. The examination, which is held twice in each year—namely, in June and December—is in two parts, and is written, oral, and practical. Candidates may present themselves for Part I. (*a*), Part I. (*b*), and II. separately or at the same time, provided that no candidate be allowed to pass in Part II. unless he has already passed in Part I. Fees—The fee for each part is £5 5*s.*, and for any subsequent examination in the same part £3 3*s.* Instruction in Sanitary Chemistry and Bacteriology is given in the second and third terms. Practical work under arrangement with the Leeds City Council. Prospectus can be obtained from the Dean of the Medical School.

University of Bristol.—Diploma in Public Health. Candidates must be at least 23 years of age, shall be fully registered medical practitioners of not less than 12 months' standing as such, and shall have passed the examination prescribed by regulation. The examination is divided into two parts. The subjects of the First Part are Chemistry as applied to Public Health and Pathology and Bacteriology. Candidates for the First Part shall, during six months after having obtained a registrable qualification, have received practical laboratory instruction in Hygienic Chemistry, in Bacteriology, and in the Pathology of the Diseases of Animals Transmissible to Man. The subjects of the Second Part are: Public Health and Epidemiology, Sanitary Law, Vital Statistics, and Sanitary Reporting.

For information as to Post graduate instruction apply to the Director of Post-graduate Studies, Professor Walker Hall.

University of Edinburgh.—Two degrees in Science in the Department of Public Health are conferred by the University of Edinburgh—viz., Bachelor of Science in Public Health and Doctor of Science in Public Health. A Diploma in Tropical Medicine and Hygiene is also granted. Candidates for the degree of B.Sc. in Public Health must be graduates in Medicine of a recognised University, and must pass two examinations, for the first of which they must, after graduation in Medicine, have worked for at least 20 hours per week during a period of not less than eight months, of which at least five consecutive months must be in the Public Health Laboratory of the University of Edinburgh and the remainder either there or in a laboratory recognised by that University; they must also have attended courses of instruction in Physics and Geology in some Scottish University. Candidates are not admitted to the Second Examination sooner than six months after having passed the First Examination, nor sooner than 18 months after having taken their degree in Medicine, and they must have attended two separate courses in Public Health in some University of the United Kingdom or in such medical school or Indian, Colonial, or Foreign University as may be approved for the purpose by Edinburgh University, each course consisting of 40 lectures at least; one of which courses shall deal with medicine and the other with engineering, each in its relation to public health. The subjects of examination include Laboratory work, Physics, Geology, Medicine in its application to Public Health, Sanitation, Sanitary Law, and Vital Statistics. Graduates who have held the degree of B.Sc. in Public Health from the University of Edinburgh for a term of five years may offer themselves for the degree of D.Sc. in Public Health in that University. They must then present a Thesis and pass an examination in Public Health. The fees are £3 3*s.* for the First and £3 3*s.* for the Second B.Sc Examinations, and £10 10*s.* for the degree of D.Sc.

University of Aberdeen.—The Diploma in Public Health (D.P.H.) is conferred only on graduates in Medicine of a University in the United Kingdom not less than 12 months after medical graduation. Every candidate must produce evidence of having complied with the following requirements: (1) A course or courses of instruction consisting of not fewer than 50 meetings dealing with public health in relation to the administrative and other duties of a medical officer of health, such course or courses to be given by a teacher or teachers in the department of public health of a recognised medical school. (2) Practical instruction within a laboratory or laboratories approved by the University, in (*a*) Bacteriology, (*b*) Physics and Chemistry, (*c*) Parasitology, such instruction to extend over not less than six months or two academic terms. (3) Practical Instruction, Clinical and Administrative, within (*a*) a hospital for general infectious diseases—not less than thrice weekly; (*b*) a hospital or sanatorium or treatment centre for tuberculosis—not less than once weekly; (*c*) a hospital or treatment centre for venereal diseases—not less than once weekly; such instruction in each group to extend over three months. (4) Practical instruction and experience during not less than three months in the duties, routine and special, of public health administration, under the personal supervision of a medical officer of health or other medical officer, or, alternatively, that the candidate has held, within the British Dominions, for a period of not less than three years, an appointment as medical officer of health of a sanitary district with a population of not less than 15,000. (5) Practical instruction in: (*a*) Mother and Child Welfare at a Centre or Centres in a Welfare Scheme conducted or approved by a Local or Sanitary Authority—not fewer than ten meetings; (*b*) School Hygiene and Medical Inspection of School Children—not fewer than six meetings; (*c*) Drawing and Interpretation of Plans—not fewer than six meetings. The fee for the examination is £4 4*s.* for each part, or £8 8*s.* for the whole examination.

University of Dublin (Trinity College).—The Diploma in Public Health is conferred, after examination, on the following conditions. The candidate must be a registered medical practitioner and have obtained a registrable qualification at least nine months before the second part of the examination. The candidate must have completed, subsequently to obtaining a registrable qualification, four months' practical instruction in a chemical and bacteriological laboratory, or laboratories, approved by the University, must have studied practically outdoor sanitary work for six months under an approved officer of health, and must have attended for three months at a fever hospital where opportunities are afforded for the study of methods of administration. A special prospectus and a list of recognised laboratories may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.—At this University there is a Diploma in Public Health and a B.Sc. in Public Health. The Diploma may be granted to matriculated or non-matriculated students of the University who shall have completed approved courses of study and shall have passed the prescribed examinations, provided that it shall not be granted except to a registered medical practitioner. Candidates may present themselves for the examination after an interval of not less than 12 months from the time of obtaining a registrable qualification. The curriculum extends over a period of not less than nine calendar months. Every candidate must produce a certificate that he has attended practical instruction in a laboratory, approved by the University, in Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man. The examination consists of two parts, which may be passed separately or together. Part I. comprises the following subjects: Chemistry, Meteorology and Climatology, and Sanitary Engineering and Architecture. Part II. comprises the following subjects: Bacteriology, Hygiene, Sanitary Law, and Vital Statistics. The examination in each part will be oral and practical as well as written.

For the B.Sc. in Public Health a candidate shall not be admitted unless he (*a*) shall have received the degrees of M.B., B.Ch., and B.A.O. at least one year previously; (*b*) shall have pursued an approved course of study in the Faculty of Medicine; and (*c*) shall have passed the prescribed examination. In addition to D.P.H. course the candidate will be required to take up (1) a Special Course of Pathology; (2) Bacteriology; and (3) Advanced Course in Hygiene. Each of these courses lasts three months.

University of Belfast.—A Diploma in Public Health is given by examination. Every candidate must produce evidence that, after obtaining a registrable qualification, he has during six months received practical instruction in an approved laboratory in which Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man are taught. After obtaining a registrable qualification every candidate must produce evidence that he has attended during three months the practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. The examination must have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of health. The examination will be held once yearly, Part I. in March and Part II. in June. The first part of the examination will have reference to the general principles of sanitary science, and the second part to State Medicine and to the applications of Pathology and Sanitary Science. The fee for each part is 1 guinea

Royal College of Physicians of London and the Royal College of Surgeons of England.—The following are the regulations for obtaining the Diploma in Public Health: The examination consists of two parts. The first part of the examination takes place in January and July, and the second part in January and July. The fee for each part is £10 10*s*., except for those who are diplomates of the Royal Colleges, who pay £6 6*s*. for each part. A candidate intending to present himself must give 14 days' written notice to the Secretary, at the Examination Hall, Queen-square, London, W.C. 1. He will be admissible to examination in Part I. on producing evidence (1) of having been in possession of a registrable qualification for at least 12 months; and (2) of having attended thereafter practical instruction in a laboratory recognised by the Examining Board in England for at least 240 hours during a period of six months. A candidate will be admitted to Part II. of the examination on producing evidence (1) of having been diligently engaged in acquiring a practical knowledge of Public Health administration during six months under certain specified conditions; and (2) of having attended during three months the clinical practice of a hospital for infectious diseases.

Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow.—All candidates for the Diploma in Public Health must have a qualification which has been registered under the Medical Acts. Candidates must have attended not less than four calendar months' practical instruction in Chemistry and Bacteriology in a recognised laboratory or laboratories, must have studied outdoor sanitary work for six months under a medical officer of health or other sanitary officer; and must give evidence of attendance for three months at the practice of a Hospital for Infectious Diseases, at which he has received instruction in the methods of administration. The examination consists of two parts, and candidates may enter for both at one period or for either separately. The First Part includes (*a*) Laboratory Work (Chemistry and Bacteriology), (*b*) Physics and Meteorology; and the Second Examination embraces (*a*) Report on Premises visited, (*b*) Examination at Fever Hospital, (*c*) Examination at Public Abattoir, (*d*) Written and Oral Examinations on Epidemiology and Endemiology, (*e*) Vital Statistics and Sanitary Law, and (*f*) Practical Sanitation. The fee is 12 guineas for both examinations, or 6 guineas for either of them. A fee of 3 guineas is payable by rejected candidates for either examination. The examination is held twice yearly, in May and October. The published regulations provide detailed synopses of the subjects of examination. The Registrar for Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and for Glasgow Mr. Walter Hurst, 242, St. Vincent-street.

Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland.—Every candidate for the Diploma in Public Health must be a registered medical practitioner. He must subsequently to qualification (1) receive four months' laboratory instruction in Chemistry, Bacteriology, and the Diseases of Animals transmissible to man; and (2) during six months practically study outdoor sanitary work under a medical officer of health, and shall as an additional requirement attend a hospital for infectious diseases. Candidates are examined on four days, commencing on the first Monday of February, May, and November. The examination comprises the following subjects:—Hygiene, Chemistry, Meteorology and Climatology, Engineering, Vital Statistics, Sanitary Law, and Bacteriology. The fee for the examination is £10 10*s*. For further particulars apply to Alfred Miller, O.B.E., Secretary, Committee of Management; Office, Royal College of Surgeons, Dublin.

DIPLOMAS IN PSYCHOLOGICAL MEDICINE.

THE needs for Schools of Psychiatry were well stated two years ago in the annual report of the Board of Control, when attention was called to deficiencies in the arrangements as at present organised for the treatment of persons suffering from mental disorder, especially in its early stages. During the two years that have elapsed both the loss to the country and the hardship to individuals resulting from insufficient attention to incipient mental cases have been recognised by the medical profession and all sections of the thinking public, so that any educational development improving the scientific position of psychological medicine will meet with warm approval.

Diplomas in Psychological Medicine, though of comparatively recent date, have been instituted at various centres for some ten years, while affiliation of mental clinics to the teaching in general hospitals has been much recommended. When this takes place there will be no dearth of suitable applicants for posts at asylums, for many young men can then be trained to take up the work in sympathetic

and scientific spirit. But before the lunacy service can become attractive, the views of the Board of Control, which have been stated to the Visiting Committees of Asylums, must receive practical expression by a general improvement in salaries, in accommodation for married officers, and by the provision in asylums for the more effective treatment upon modern lines of recoverable cases. The following bodies have now arranged to grant diplomas in psychological medicine or psychiatry—namely, the Universities of Manchester, Leeds, Edinburgh, Cambridge, Durham, and London, and the Royal College of Physicians of London. The regulations for obtaining these diplomas point to much similarity in the scope of the examinations, though there are differences in the duration of the courses and the syllabus, details of which can be obtained from the various examining bodies.

The necessity for raising the standard of the training for Assistant Medical Officers in asylums, and of affording facilities for such training, is very real. If the authorities give proper preference to the candidates for vacancies who possess diplomas or degrees in mental disease the status of this branch of the medical profession will be automatically raised, and pay and conditions of service will have to be made commensurate. It is necessary that the Authorities should make arrangements to grant study-leave on full pay to their Assistant Medical Officers, especially if it is the object of these officers to obtain a diploma which they were previously without; and augmented salary might well be paid to successful examinees. In the face of the facts acquired in recent years as to mental health, it is necessary that psychological medicine should now form an integral if special part of medical education, so that no university should willingly be without such an organic unit as a School of Psychiatry.

DENTAL SURGERY.

ANYONE who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without a licence in dentistry; but it is of eminent advantage to take the L.D.S., otherwise few dental appointments at general or special hospitals or dispensaries are available. The subjects beyond those included in the general qualification are—Dental Anatomy and Physiology (Human and Comparative), one course; a separate course of Dental Histology, including the preparation of microscopical sections; Dental Surgery, one course; a separate course of Practical Dental Surgery; a course of not less than five lectures on the Surgery of the Mouth; Dental Mechanics, one course; a course of Practical Dental Mechanics, including the manufacture and adjustment of six dentures and six crowns; Dental Metallurgy, one course; a course of Practical Dental Metallurgy; Practice of Dental Surgery at a recognised school, two years, and a certificate of having been engaged during a period of not less than two years in acquiring a knowledge of Dental Mechanics (this may be obtained by apprenticeship to a duly qualified dental practitioner or in the mechanical department of a recognised dental hospital). The Dental Schools in London are the Royal Dental Hospital of London, the National Dental Hospital, Guy's Hospital Dental School, and the London Hospital Dental School. Most of the large provincial towns, where there are medical schools, have now dental hospitals.

The Registration of Dental Students is carried on at the Medical Council Office in London in the same manner as the existing registration of medical students, and subject to the same regulations as regards Preliminary Examinations. Candidates for a diploma in Dental Surgery must produce certificates of having been engaged during four years in professional studies, including two years' instruction in mechanical dentistry. The two years of instruction in mechanical dentistry, or any part of them, may be taken by the dental student either before or after his registration as a student. When a student can show evidence of regular pupilage in mechanical dentistry to a registered practitioner prior to the passing of a preliminary examination he may be allowed to antedate for a period not exceeding one year prior to the passing of a preliminary examination. The recommendations as to the course of study and examinations adopted by the General Medical Council in November, 1909, are under revision by the Council, but consideration of them is postponed until the Departmental Committee on the Dentists Act has reported.

It is necessary for anyone practising Dental Surgery in this country to be on the Register, and no foreign qualifications are recognised, except the Dental Diploma granted in Belgium after examination by the Provincial Medical Commission, provided the holder has obtained the grade of "Candidate in Medicine" at one of the four Belgian Universities. Persons with Colonial and Foreign qualifications which have been obtained after a four years' curriculum can apply for special registration. Certain dental qualifications granted in Australia and New Zealand are also registrable. The Royal Colleges of the United Kingdom and ten of the Universities grant degrees or licences in Dental Surgery.

THE REGISTERING BODIES IN DENTISTRY.

The Royal College of Surgeons of England grants a diploma in Dental Surgery under the following regulations, which apply to all candidates who have registered as dental students after Jan. 1st, 1897. Candidates are required to pass three examinations: the Preliminary Science Examination, the First Professional Examination, and the Second Professional Examination. I. Preliminary Science Examination.—This is identical with Part I. of the First Examination of the Examining Board in England. Candidates who commenced professional study on or after Oct. 1st, 1913, must pass the Preliminary Science Examination before commencing the courses required for the Second Professional Examination. II. The First Professional Examination.—The candidate must produce evidence of instruction in Dental Metallurgy and Practical Dental Mechanics. The Examination consists of Part I. (Mechanical Dentistry) and Part II. (Dental Metallurgy), the examination in Dental Metallurgy being by written paper. The parts may be taken together or separately. III. The Second Professional Examination.—This is divided into two parts: (*a*) the General, (*b*) the Dental. The General part must be passed before the Dental portion. The instruction is obtained partly at a General Hospital and partly at a Dental Hospital.—The Second Professional Examination consists of: Part I., General Anatomy and Physiology, General Surgery and Pathology; Part II., Dental Anatomy and Physiology, Dental Pathology and Surgery, and Practical Dental Surgery. There is a written and *vivâ voce* examination in each part and a practical examination as well in Part II. Exemption from the Preliminary Science Examination is granted to candidates who have passed an Examination in Chemistry and Physics for a degree in Medicine at a University in the United Kingdom, in India, or in a British colony. Exemption from Examination in Anatomy and Physiology is granted to candidates who have passed the Second Examination of the Examining Board in England or the corresponding Examination for any degree or qualification in Medicine or Surgery registrable under the Medical Act of 1886. Exemption from Examination in General Surgery and Pathology is granted to candidates who have passed the Examination in Surgery of the Examining Board in England or the corresponding Examinations of the Colleges and University above mentioned. The fee for the diploma is 20 guineas, and is payable as follows:—Preliminary Science Examination, for each admission to Part I., £3 3*s.*; Part II., £2 2*s.* First Professional Examination, for each admission to Part I., £4 4*s.*; Part II., £2 2*s.*; Second Professional Examination, for each admission to Part I., £4 4*s.*; Part II., £5 5*s.* Synopses of examinations and all further information can be obtained from the Secretary, Examination Hall, Queen-square, London, W.C. 1.

Royal College of Surgeons, Edinburgh.—Regulations giving a list of Preliminary Examinations recognised for obtaining the Licence in Dental Surgery, as well as of the subjects of the Professional Examinations, may be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, at 49, Lauriston-place, Edinburgh. Candidates must produce certificates of having, subsequently to the date of registration, been engaged for four years in professional studies and of three years' instruction in Mechanical Dentistry from a regis-

tered dental practitioner, except in the case of previously registered medical practitioners, when two years will be considered sufficient. Candidates must also have attended a course of instruction at a University or in an established school of medicine or in a provincial school specially recognised by the College as qualifying for the Diploma in Surgery. In addition they will be required to have attended in a recognised dental hospital, or with teachers recognised by the College, special courses of lectures and instruction in Anatomy and Physiology (Human and Comparative), Surgery, Pathology, Materia Medica, Dental Histology, and Practical Dental Mechanics and Metallurgy; two years' attendance at a dental hospital or the dental department of a general hospital recognised by the College. Practical instruction in Mechanical Dentistry from a registered Dentist, or in the Mechanical Department of a recognised Dental Hospital and School, for *three* years. Candidates who have passed the First and Second Examinations for the Triple Qualification will be exempt from the First Dental Examination, and will have the advantage of being admissible either to the Final Dental Examination or to the subsequent Examination for the Triple Qualification, or to both. But the First Dental Examination will not be held as equivalent to the First and Second Triple Examinations, and will admit to the Final Dental Examination only. Candidates who are Licentiates of this College or who may be registered medical practitioners will be required to produce certificates of attendance on the special subjects only and will be examined in these only for the dental diploma. First Professional Examination: The candidate must have attended the required courses. The examination embraces (1) Chemistry and Physics; and (2) Anatomy and Physiology. The fee is £5 5*s*. for the complete examination, and £3 3*s*. is payable for each division. In all cases of rejected candidates the fee for re-entry is £3 3*s*. Second Examination: The candidate must have attended the remaining courses of the curriculum, must produce certificates showing that he is 21 years of age, and must pay a fee of £10 10*s*., for re-entry £5 5*s*. The examination embraces (1) Surgery and Medicine; and (2) the special subjects of Dental Anatomy and Physiology, Dental Surgery and Pathology, Dental Materia Medica, Dental Mechanics and Dental Metallurgy, with a practical as well as the written and oral examinations in the subjects of Dental and Oral Surgery, Pathology, and Mechanics. The candidate will be tested in the Treatment of Dental Diseases, in Operative Dentistry, the Administration of Anæsthetics, Orthodontics, and in Prosthetic and Mechanical Dentistry. Candidates who claim exemption from the First Dental Examination on the ground of having passed the First and Second Triple Qualification Examinations or other recognised examinations will, before being admitted to the Second Dental Examination, be required to pay the total fee of £15 15*s*. payable for the dental diploma. Fees and schedules must be lodged with the Clerk not later than one week before the examination.

Higher Dental Diploma.—The College grants a Higher Dental Diploma which is registrable in the Dentists Register as an additional qualification. Every candidate for the Higher Dental Diploma shall produce evidence that he has been engaged in the study or practice of his profession as a Registered Dentist for at least one year subsequent to his having obtained the Licence in Dental Surgery of the College, or a Licence or Qualification in Dental Surgery specially recognised by the College. Particulars as to the examinations can be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, 49, Lauriston Place, Edinburgh. The fee payable by Licentiates of the College is £15 15*s*. For all other candidates £21. A fee of £10 10*s*. is retained for examination expenses in the case of referred candidates.

The examination embraces the following branches of Dental Science and practice: Dental Surgery, Anatomy, Pathology and Bacteriology, Prosthesis, Anæsthesia, and Dental Radiology. The examination will be clinical and practical as well as written and oral. Candidates will be expected to show a high degree of knowledge and skill.

Royal Faculty of Physicians and Surgeons of Glasgow.—The regulations as to certificates, curriculum, number, and subjects of examinations, fees, &c., are in effect similar to those of the Royal College of Surgeons of Edinburgh, but embrace Dental Bacteriology. Candidates can enter for the First Examination in three divisions, the first embracing Physics and Chemistry, the second Dental Metallurgy and Dental Mechanics, and the third Anatomy and Physiology. The examination in Dental Mechanics is practical; and there is at the Final Examination an examination in Practical Dentistry conducted in a dental hospital. Copies of regulations, &c., to be obtained from Mr. Walter Hurst, Registrar, Faculty Hall, 242, St. Vincent-street, Glasgow.

Royal College of Surgeons in Ireland.—Candidates for the Licence in Dental Surgery are required to pass two professional examinations. Before the First Examination the candidate must produce evidence of having attended courses in Theoretical and Practical Chemistry, including Metallurgy and Physics, at a recognised institution; of having been registered as a medical or dental student by the General Medical Council; and of having attended courses of instruction in the following subjects at a recognised school of medicine: (*a*) Anatomy Lectures; (*b*) Dissections with Demonstrations; (*c*) Physiology, including Dental Physiology; (*d*) Practical Physiology and Histology, including Dental Physiology and Histology, Human and Comparative. Before the Final Dental Examination the candidate must have been engaged during a period of two years in acquiring a practical familiarity with the details of Mechanical Dentistry under the instruction of a registered dentist, or under the direction of the superintendent of the Mechanical Department of a recognised Dental Hospital, and have attended, at institutions recognised by the College for the purpose, the following courses of instruction: (*a*) Dental Surgery and Pathology, Orthodontia, and the Materia Medica and Therapeutics applicable to Dental Surgery. Lectures. Two courses. (*b*) Dental Mechanics. Lectures. Two courses. (*c*) Dental Anatomy. Lectures. One course. (*d*) The practice of a Dental Hospital, or of the Dental Department of a General Hospital. Two years. He must also have attended Clinical instructions at a recognised General Hospital during the ordinary teaching sessions (nine months), and have been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a medical or dental student. One year's bona-fide apprenticeship with a registered dental practitioner, after being registered as a medical or dental student, may be counted as one of the four years of professional study. He must be 21 years of age.

In the First Dental Examination candidates will be examined in (A) Physics and Chemistry, including Practical Chemistry and Metallurgy. (B) Anatomy, Physiology, and Histology—General and Dental. All the subjects may be passed at the same time, or they may be passed in two groups, (A) and (B). The examination is partly written, partly *vivâ voce*, and partly practical.

In the Final Dental Examination candidates will be examined in General Pathology, Medicine, and Surgery; Dental Surgery, and Dental Pathology, with the Materia Medica and Therapeutics applicable to Dental Surgery; Dental Mechanics and Metallurgy; Orthodontia. Candidates must pass in all the subjects at one examination. The examination is partly written, partly *vivâ voce*, and partly practical, and includes the examination of patients and the performance of dental operations. Candidates are required to provide their own instruments and gold for filling. The First Dental Examination will commence on the first Mondays in the months of February, May, and November. The Final Dental Examination will commence on the second Mondays in the months of February, May, and November. The total fee for the Diploma in Dental Surgery is 20 guineas. Candidates must pay the fees for examinations from which they are exempted, unless when such exemptions have been granted in virtue of examinations passed before the Conjoint Board in Ireland.

University of Birmingham.—The teaching of Dentistry is undertaken by the University acting in association with the Birmingham Dental Hospital and the Birmingham Clinical Board. The instruction at the Dental Hospital is carried out under the direction of the University Dental Clinical Board, so that students may fully qualify themselves for the Dental Diploma (L.D.S.) of this and other universities and licensing bodies. There is a special and well-equipped Dental Museum and Laboratory. An Entrance Exhibition, value £37 10*s*. is awarded annually at the commencement of the winter session. The following are the regulations for Degrees in Dentistry:—1. The degrees conferred by the University are those of Bachelor and Master of Dental Surgery

(B.D.S. and M.D.S.). 2. All candidates for these degrees must pass the same Matriculation Examination as that required from candidates for Medical Degrees. 3. The degree of Bachelor of Dental Surgery is not conferred upon any candidate who has not obtained a Licence in Dental Surgery. The candidate is not eligible for the degree until a period of 12 months has elapsed from the passing of his examination for the Licence in Dental Surgery. Of this period at least six months must be spent in the dental department of a general hospital approved by the University. 4. *A.* In addition to the Licence in Dental Surgery the candidate must produce evidence that he has attended the courses required by medical students of the University in the following subjects and passed the Examinations held in the same for Medical and Surgical Degrees: (*a*) Chemistry and Practical Chemistry, (*b*) Physics and Practical Physics, (*c*) Elementary Biology, (*d*) Anatomy and Practical Anatomy, and (*e*) Physiology and Practical Physiology. *B.* That he has passed the class examinations in: (*f*) One Special Course of Lectures on Medicine, (*g*) One Special Course of Lectures on Surgery, and (*h*) Pathology and Bacteriology. *C.* That he has attended courses and passed the class examinations in: (*k*) Dental Histology and Patho-Histology, (*l*) Comparative Dental Anatomy, and (*m*) Dental Surgery and Prosthetic Dentistry. *D.* That he has received instruction in the Clinical Examination of living cases at the dental department of a general hospital for a period of not less than six months. 5. The Final Examination will deal with the subjects in Classes *C* and *D*. 6. On the expiration of 12 months from the date of passing the Examination for the Degree of Bachelor of Dental Surgery, the candidate will be eligible for that of Master of Dental Surgery. 7. For this degree candidates will be required to submit a thesis containing original work and investigations in some subject connected with Dentistry, which thesis shall be submitted to examiners to be nominated by the Dental Advisory Board.

University of Bristol.—Candidates for the degree of Bachelor of Dental Surgery must be not less than 21 years of age and shall have pursued the courses prescribed by University regulations during not less than five years, of which three shall have been passed in the University, and shall have been registered as dental students by the General Medical Council. All candidates for the degree of B.D.S. are required to satisfy the examiners in the several subjects of four examinations. The First Examination: The subjects are Chemistry, Physics, and Zoology, and the curriculum extends over one year.* The Second Examination: The subjects are Dental Mechanics, Dental Metallurgy, and Dental Materia Medica, and the candidate shall produce evidence of having served for two years an approved pupilage in Dental Mechanics. The Third Examination: The subjects are Anatomy, Physiology, and Histology, Dental Anatomy, and Dental Histology. The Final Examination: The subjects are Medicine and Surgery, Dental Surgery (including Prosthetics), Operative Dental Surgery, and Dental Bacteriology. Degree of Master of Dental Surgery: Candidates shall be Bachelors of the University, shall present a Dissertation on some subject of Dental Surgery to be approved by the Examiners, and pass an examination in Dental Surgery. Diploma in Dental Surgery: Candidates need not be undergraduates, but shall be registered dental students before being admitted to any professional examination; the curriculum extends over four years. A two years' pupilage in Mechanical Dentistry is required, and four examinations must be passed, the subjects of which differ only from those of the B.D.S. in that Zoology is not required for the First Examination, and Medicine is not required for the Final Examination. Candidates who are already registered medical practitioners shall be further exempted from study and examination in Physics and Chemistry, Anatomy, Physiology and Histology, Medicine, and General Surgery.

University of Durham.—Every candidate for the Licence in Dental Surgery must be registered as a dental student. There are four Examinations. The subjects are:—*First:* (*a*) Chemistry; and (*b*) Physics. *Second:* (*a*) Dental Mechanics, Theoretical and Practical; (*b*) Dental Metallurgy. *Third:* (*a*) Anatomy; (*b*) Physiology and Histology; (*c*) Dental Anatomy and Dental Histology; and (*d*) Dental Materia Medica. *Final:* (*a*) Surgery; (*b*) Dental Surgery, including Prosthetics and Orthodontia; (*c*) Operative Dental Surgery, Practical Examination; and (*d*) Dental Pathology and Bacteriology. A candidate before presenting himself for examination is required to furnish certificates of instruction in the following subjects, attended after registration as a dental student at recognised Colleges or Schools:—*First Examination:* Chemistry and Physics. *Second Examination:* Dental Mechanics and Dental Metallurgy. *Third Examination:* Anatomy, with Dissections; Physiology; Histology; Dental Anatomy and Physiology; Dental Histology; and Dental Materia Medica. *Final Examination:* Dental Hospital Practice (two years); General Hospital Practice (nine months); Medicine Lectures (two terms); Surgery Lectures (two terms); Dental Surgery and Pathology (a course of not less than 20 lectures); Dental Bacteriology (three terms); Operative Dental Surgery (not less than 12 lectures); and Anæsthetics (a course of not less than one month).

Before admission to the Final Examination each candidate must furnish evidence (1) of having attained the age of 21 years; (2) of having undergone a three years' pupilage in Mechanical Dentistry with a registered dentist; and (3) of having been engaged in professional study for at least four years subsequent to registration as a dental student. The examinations will be held concurrently with the medical examinations, and the fees payable by candidates are as follows: First Examination, £2 10*s.*; Second Examination, £2 10*s.*; Third Examination, £3 10*s.*; Final Examination, £3 10*s.*; fee for Licence, £3; total, £15. For re-examination: First Examination, £1 10*s.*; Second Examination, £2; Third Examination, £2 (in one part only, £1); Fourth Examination, £2. The practical examinations in dentistry will be conducted at the Newcastle Dental Hospital.

University of Leeds.—The degrees in Dental Surgery are Bachelor of Dental Surgery (B.Ch.D.) and Master of Dental Surgery (M.Ch.D.). All candidates for the degree of Bachelor of Dental Surgery shall be required to have passed the Matriculation Examination, to have pursued thereafter approved courses of study for not less than five academic years, two of such years at least having been passed in the University subsequently to the date of passing Parts I. and II. of the First Examination, and to have completed such period of pupilage or hospital attendance, or both, as may be prescribed by the regulations of the University. No candidate will be admitted to the degree who has not attained the age of 21 years on the day of graduation. The classes in the Department of Dentistry begin on Oct. 1st. The instruction in the Preliminary subjects of Chemistry, Physics, and Biology are given at the University in College-road. The classes in the other subjects and the systematic courses in Dental subjects are held in the School of Medicine of the University in Thoresby Place. The clinical instruction is given in the Dental Department of the Leeds Public Dispensary, which is affiliated with the University and recognised by the Royal College of Surgeons. Applications for the prospectus should be made to the Dean of the Faculty of Medicine.

University of Liverpool (Liverpool Dental Hospital Clinical School and School of Dental Surgery).—The University grants a Licence in Dental Surgery (L.D.S.) and degrees in Dental Surgery (B.D.S. and M.D.S.). The courses of systematic instruction are given in the University buildings, five minutes' walk from the Dental Hospital. The two institutions are now closely associated, and the management of the curriculum is in the hands of the Board of Dental Studies. The Dental Hospital, covering a site of 672 square yards, is equipped in each department with every modern accessory and receives constant additions. The laboratory is in charge of a skilled dental mechanic under the supervision of the Director of Dental Education and Dental Staff, and students are able to undertake at the hospital the whole of their training in Mechanical Dentistry. The times of the lectures at the University are arranged to meet the convenience of students, thus allowing the maximum time for attendance upon Dental Hospital practice. Fees: The composition fees are as follows: Licence course (L.D.S.): Composition fee £58 10*s.*, for the course of other licensing bodies £61 10*s.*, payable in two equal instalments, the first on entry, the second 12 months

* Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination for either the B.D.S. or the L.D.S., and will be regarded as having completed one year of study.

later. Two years' instruction in Mechanical Dentistry (pupilage) and two years' Dental Hospital Practice (combined), £100, or in two instalments of £52 10*s*. each. Degree course (B.D.S.): £67 10*s*. for all lectures (including Chemistry, Physics, and Zoology) in three instalments. Two years' dental hospital, £21; general hospital practice, £10 10*s*.; three years' mechanical instruction (pupilage), £105. The fees for tuition have now been increased by one-third. Further information may be had from the Director of Dental Education, Mr. W. H. Gilmour.

University of Manchester.—In the University of Manchester the Dental Department forms an integral part of the Faculty of Medicine. This contains a series of laboratories, lecture rooms, and museums which will bear comparison with those of any other school in the kingdom, and the fullest opportunities for study are offered to students preparing for any of the professional examinations. Instruction adapted to the requirements of students preparing for the B.D.S. Degree and the Dental Diplomas of the University, the Royal College of Surgeons of England, and of other licensing bodies is given during the Winter and Summer Sessions both at the University and at the Dental Hospital of Manchester adjoining the University. The required general hospital practice is taken at the Manchester Royal Infirmary. Women students are admitted to the classes in the Dental Department, and for them common rooms are provided. The composition fee for candidates for the University degree of Bachelor of Dental Surgery is 90 guineas, payable in two equal instalments at the beginning of the first and third years of studentship. The composition fee for candidates for the University Diploma in Dentistry is 80 guineas, payable in two equal instalments at the beginning of the first and third years of studentship. The composition fee for candidates for the L.D.S. of England is 90 guineas, payable in two equal instalments at the beginning of the first and third years of studentship. Students who have already served their apprenticeship with a private practitioner, and who propose to complete the final portion of their attendance at the University and at an approved dental hospital, will be required to pay the composition fee in two equal instalments at the commencement of the first and second years of studentship. The composition fee does not include the hospital fees, the examination fees, nor the fee for the conferment of the degree or the diploma.

National University of Ireland.—This University grants the degrees of Bachelor of Dental Surgery and a degree of Master of Dental Surgery. A student may not be admitted to the Degree of Bachelor of Dental Surgery unless a period of not less than four years shall have elapsed from the date of his matriculation, during which period he must have pursued an approved course of study of not less than nine terms. For the degree of Bachelor of Dental Surgery candidates must pass four examinations, the first two being the same as those for the first and second examination in Medicine. The subjects of the third examination are Dental and Practical Pathology, Dental Surgery and Dental Medicine, the subjects of the fourth being Dental Surgery and Pathology, Dental Mechanics, Operative Dentistry, Orthodontia, and Dental Materia Medica. A candidate for the degree of B.D.S. must produce evidence of having been engaged during a period of two years in acquiring a practical familiarity with the details of Mechanical Dentistry under the instruction of a registered dentist, or under professional direction in the mechanical department of a dental hospital approved by the University. A portion of or the entire period may be served before commencing study for the degree of B.D.S., but no portion so taken prior to commencement of study shall count as part of the four years of Dental Study. The degree of Master of Dental Surgery will not be granted until three years after the B.D.S. has been obtained.

Queen's University of Belfast.—At the beginning of next session a Department of Dentistry will be opened, and in due course the University expects to confer a Licentiate in Dental Surgery, a Bachelor of Dental Surgery, and a Master of Dental Surgery. Lecturers have been appointed in Dental Surgery, Dental Mechanics, Dental Metallurgy and Materia Medica, and Orthodontia.

University of Melbourne.—Degrees of Bachelor (B.D.Sc.) and Doctor of Dental Science (D.D.Sc.) are granted. Candidates for the former are required subsequently to matriculation (which must include physics) to take a four years' course of study and to pass four examinations. They shall be apprenticed for not less than three years with a registered dentist in some part of the British Empire. Fee for the four years £100, payable in four equal annual instalments. Annual examination fee £5 5*s*. Candidates for the degree of Doctor must be Bachelors of Dental Science of at least two years' standing. The examination is partly written and partly oral. A thesis may be submitted.

University of Sydney.—A degree in Dental Surgery (B.D.S.) is granted after a four years' course following matriculation. A graduate in medicine is required to devote four terms to dental study before sitting for the degree of B.D.S. and a licentiate in dental surgery one additional year.

University of Adelaide.—The four years' course for the B.D.S. is regulated by similar conditions to that for the M.B., B.S. Four examinations are held in November of successive years. The fee for each ordinary examination is £3 3*s*., and for the degree £5 5*s*. Fees for the whole course amount to £95 11*s*.

McGill University, Montreal.—The degree of D.D.S. is granted on a four years' curriculum, the first year being that demanded of students in the Medical Faculty.

University of Toronto.—The degree of D.D.S. is granted on a four years' curriculum. Annual examinations are conducted under the joint auspices of the University and the Royal College of Dental Surgeons of Ontario. Concurrent courses may be run in medicine and dentistry extending over seven years.

University of Malta.—The University grants its diploma in dental surgery after examination to candidates producing evidence of four years' professional study and three years' instruction in mechanical dentistry.

TEACHING INSTITUTIONS IN DENTISTRY.

See also under Universities of Birmingham, Leeds, Liverpool, and Manchester above.

LONDON.

Royal Dental Hospital of London, School of Dental Surgery, Leicester-square.—A school of the University of London, and women are now admitted as students and are eligible for all hospital appointments and school prizes.—The school provides the special dental education required by the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The demonstrators at the commencement of each session give a course of lectures on Operative Dental Surgery. The six house surgeoncies are held for six months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £50. One Entrance Scholarship in Dental Mechanics and Metallurgy value £25, open to pupils of the Hospital only. One Entrance Scholarship of £25 in Dental Mechanics, open to pupils of private practitioners. The Saunders Scholarship of £20 and Saunders Prize of £5 awarded to second year students. The Storer Bennett Research Scholarship for Scientific Research in any branch of Dental Surgery, value £50, is awarded triennially. The Alfred Woodhouse Scholarship of £35 and the Robert Woodhouse Prize of £10 for Practical Dental Surgery. Prizes and certificates are awarded by the lecturers for the best examinations in the subjects of their respective courses at the end of the summer and winter sessions. Fee for two years' hospital practice required by the curriculum, including lectures, £70 in one payment, or £73 10*s*. in two yearly instalments. The curriculum requires two years to be passed at a General Hospital; the fee for this is about £63. Both hospitals can be attended simultaneously. For the lectures in Chemistry and Physics for the Preliminary Science Examination £13 13*s*. The fee for the instruction in Dental Mechanics and the two years' hospital practice required by the curriculum is £200 if paid

in one instalment, or 200 guineas if paid in three equal instalments. The fee for tuition in Dental Mechanics is £70 per annum; for one year's hospital practice £28. The Winter Session opens on Oct. 1st.

University College Hospital Dental School.—Corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Chemistry, Physics, Anatomy, and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the National Dental Hospital. The First Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. Two Entrance Exhibitions, of the value of £40 and £20, are open for competition. Prizes are open for competition at the end of each course of lectures. Fees are under revision. The Calendar, containing full information as to Lectures, Fees, Prizes, and Subjects for the Entrance Exhibitions may be had on application to the Dean, who attends the Hospital on Tuesday mornings at 10.30.

Guy's Hospital.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: A new Dental Out-patient Department has been provided. There is ample accommodation for ordinary extractions and anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrator, the dental house surgeon, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It has recently been entirely remodelled and greatly enlarged, giving a floor space of over 6000 square feet. It affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type, for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. The members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by two of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out. Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the L.D.S. Eng.—viz., two years' studentship in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge. Four Scholarships in Dental Prosthetics of the value of £30 each are offered for competition annually, two in September and two in April, and prizes of the aggregate value of £40 are awarded for general proficiency and for skill in Operative Dentistry. The Newland-Pedley Gold Medal for Operative Dentistry is also awarded annually. A Dental Travelling Scholarship of the value of £100 is awarded every second year. Dental students are eligible for admission to the Residential College and enjoy the privileges of students in the Medical School. Application should be made to the Dean of the Medical School.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoon at every chair has been specially designed and has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses in addition to the Theatres, Laboratories and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Dental Metallurgy and Dental Prosthesis. A systematic course of instruction in Dental Prosthesis is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to fees and course of study advised apply to the Dean, Professor William Wright, who will be glad to make arrangements for anyone wishing to see the Dental School and Medical College.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students for the study of dentistry, and in preparation for the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women, in conjunction with the London Dental Hospital, Leicester-square, and the National Dental Hospital, Great Portland-street, W. The course is arranged as follows: First and second years: Chemistry, Physics, and Dental Mechanics. Third, fourth, and fifth years: Anatomy, Physiology, and Special Dental Courses, Courses in Medicine and Surgery, General Hospital Course, Dental Hospital Course. Bursary: The Council of the School will award annually (until further notice) an "Agnes Guthrie" Bursary of the value of £50 to a student fulfilling the required conditions, who enters for the full dental course. Candidates are required to send in applications on or before July 1st, to the Warden and Secretary, from whom a prospectus of the School and all particulars can be obtained.

PROVINCIAL.

Birmingham Dental Hospital, Great Charles-street.—Dean: Mr. W. T. Madin. The Dental Hospital was founded in 1858, and was recognised by the Royal College of Surgeons in 1880 for the teaching of Dental Students. Having an annual attendance of about 16,000 patients, it affords every advantage for students about to enter the profession to acquire a thorough practical knowledge, as required by the Medical Council. The present Hospital was opened on July 6th, 1905. It has accommodation for 50 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery. The operations performed annually average 35,000, including 5000 gold and other fillings, and many cases of crowns, bridges, porcelain inlays, and regulations. By arrangements with the Birmingham University and with the General and Queen's Hospitals the entire course of Lectures, Hospital Practice, &c., may be completed for an inclusive fee of £96 15*s.*, or including Mechanical Pupilage, £186. Examination fees for L.D.S. Birm., total £18. The instruments and materials necessary for Hospital Practice cost about £35. The Composition Fee for the courses required for the L.D.S. of the University, or any of the Corporations alone, is £60, payable in two annual instalments at the commencement of the first and second years; that for the courses required for the L.D.S. and the Degree in Dentistry of the University is £75; that for the L.D.S. in combination with the M.R.C.S. and L.R.C.P. is £85; and that for the M.B., Ch.B., and B.D.S. is £95. All of these composition fees are payable in two annual instalments at the commencement of the first and second years. Each of these fees covers the cost of the courses given at the University for the qualifications indicated, but does not include fees for Hospital teaching. For two years' dental hospital practice the fee is 20 guineas, payable in two instalments of 10 guineas each at the commencement of the first and second (hospital) years respectively. For two years' mechanical pupilage, 85 guineas, which may be paid in two annual instalments of 50 and 35 guineas respectively; mechanical pupils may join for a probationary period of one month, fee 5 guineas, which is deducted upon payment of the full amount. For

general surgical hospital practice, lectures, and demonstrations: Surgery, two winters, £10 10*s*. One Entrance Scholarship is offered annually of the value of £37 10*s*. It is awarded to the student who, entering for the Dental Degree of the University in October, or having entered not earlier than the previous April, shall pass the best examination in the subjects studied during his apprenticeship. Candidates must be under the age of 21 years. Application for admission, together with a certificate of birth, must be sent to the Dean of the Medical Faculty, Mr. William F. Haslam, on or before Oct. 15th.

Leeds University School of Dentistry.—The School of Dentistry is fully equipped to provide training for Dental Students, and affords every opportunity for the student to prepare for any of the Dental Degrees or Diplomas. The Demonstrator of Operative Dental Surgery instructs students during their probationary course. At the completion of this training students have patients allotted to them by the Demonstrator, and have every opportunity of acquiring knowledge from the members of the Staff, two of whom are in attendance each day. The following prizes are awarded:—First year Students, value 2 guineas. Operative Dental Surgery Prize, value 5 guineas. Two prizes in Prosthetic Dentistry: (*a*) a prize, value 2 guineas, for first-year pupils; (*b*) a prize, value 5 guineas, open for competition to all Students. Extraction prize, value 2 guineas, open for competition to all Students. A prize in Orthodontics, value 5 guineas, is open to all students. All communications should be addressed to the Warden, School of Dentistry, The University, Leeds.

Dental Hospital of Manchester.—This Hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given by the members of the staff and by the house surgeons and demonstrators, and also by the honorary anæsthetists in the administration of nitrous oxide gas; a special class in anæsthetics is conducted by the clinical tutor in that subject, and a class for instruction in porcelain and gold inlay work by the demonstrator specially appointed for that work.

Ten prizes, varying in value from £2 to £12 12*s*., are awarded annually.

For the whole course of hospital instruction for the L.D.S. (including two years' mechanical training) the fee is £131 5*s*., paid in instalments. For the two years' Operative Course only, £26 5*s*., paid in two instalments. For the whole course of hospital instruction for the B.D.S. degree (including mechanical training), £168, paid in instalments. Additional practice in Dental Mechanics may be taken by pupils who have already received their mechanical training elsewhere, at a fee of £36 15*s*. for six months.

All the courses of instruction are open to women students.

Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.—This Hospital is centrally situated (within five minutes of the various colleges, infirmary, and railway station); the rooms are well lighted and thoroughly equipped for carrying on the work. Dental surgeons and an anæsthetist attend each morning. A tutorial dental surgeon is also in attendance. The Composition Fee for the special Dental Lectures and Dental Hospital Practice is £45 3*s*. if paid in one sum, or £46 4*s*. if paid in two instalments of £23 2*s*. The Composition Fee for the Lectures at the Colleges of Medicine and Science is 40 guineas; in addition to this there is a library and an athletic fee. Particulars of the fee for General Hospital Practice may be obtained from the Senior House Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne. Medals and Certificates of Merit are granted to students showing certain standards of proficiency in the various classes at the Dental School. The prospectus of the Dental Hospital and School, containing full information, may be obtained from either Mr. J. T. Jameson, 12, Windsor-crescent, Newcastle-upon-Tyne, Dean, or Mr. James Coltman, 13, Ellison-place, Newcastle-upon-Tyne, Vice-Dean.

Devon and Exeter Dental Hospital, 24, Southernhay, West, Exeter.—Established 1880.—The hospital is open on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays, and patients are admitted between the hours of 9 and 11 A.M. Students attend the practice of the hospital under the control of the medical officers. Honorary treasurer, Mr. J. M. Ackland; secretary, Mr. Albert G. Littlejohn.

SCOTLAND.

The Incorporated Edinburgh Dental Hospital and School.—The Edinburgh Dental Hospital and School is located in a spacious and well-equipped building at 31, Chambers-street and offers special advantages to dental students. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. The cost of the hospital outfit of instruments is included in the Dental Hospital fee of £42. The minimum cost of classes and Diploma for the whole course of dental instruction amounts to £98 17*s*. Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The minimum cost of Professional Education, the Triple Qualification, and the Licence in Dental Surgery amounts to £172 19*s*. The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords all opportunity of obtaining a higher qualification subsequent to registration. Further particulars can be obtained from the Dean, Mr. W. Guy.

Incorporated Glasgow Dental Hospital, 15, Dalhousie-street, Glasgow.—The School is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Pathology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, and Anæsthetics. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extra-mural schools where special provision is made for Dental Students. Composition fee for two years' Hospital Practice and Lectures special to Dentistry, £40 on entry or in two instalments of £21 each. Fees for Hospital Practice and Dental Lectures may be paid for separately, at a total cost of £43 1*s*. Full information may be had on application to the Dean.

Glasgow Royal Infirmary (Dental Department).—Mr. W. R. Taylor attends at the Royal Infirmary at 9 A.M. on Wednesdays and other days as arranged. The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry with Metallurgy, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Clinical Surgery, six months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital. The attendance on the Dental Clinic is free to students of the hospital.

IRELAND.

Incorporated Dental Hospital of Ireland, Lincoln-place, Dublin.—All Dental Students who have passed their First Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital

on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica. Practical instruction is also given in Anæsthetics. In addition to the longer courses of hospital attendance, courses of three months' duration will be given to surgeons intending to practise in the Colonies or remote country districts, or in the Army and Navy.

Fees.—Dental Hospital Practice (each year), £18 18*s.*; Lectures, £5 5*s.* In addition to the above courses registered dentists who are members of the British Dental Association will usually be permitted to take out a three months' course for a fee of 6 guineas. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean.

DOMINIONS.

The Australian College of Dentistry, in connexion with the Melbourne Dental Hospital, trains candidates for the degrees of B.D.Sc. and D.D.Sc. Melb. Students indentured to the College pay £170 in two instalments of £85 each, or four instalments of £42 10*s.* The superintendent of the College is Mr. E. S. Fisher, L.D.S. D.D.Sc.

United Dental Hospital of Sydney was established in 1901 to provide facilities for the students attending the University Dental School. The fee payable by University students for the dental practice of the hospital is £6 6*s.* per annum. The secretary is Mr. H. A. Clarke, F.I.A.A.

The Dental Department of McGill University, Montreal, was opened in 1903 at the request of the Dental Association of the Province of Quebec as a section of the medical faculty. An out-patient clinic in dentistry at the Montreal General Hospital provides the clinical material. Particulars from the Registrar of the Medical Faculty.

The Royal College of Dental Surgeons of Ontario has a school of dentistry in connexion with the University of Toronto. Practical work is carried out in the infirmary and laboratories of the College.

REGISTRABLE COLONIAL AND FOREIGN MEDICAL DEGREES.

UNDER the Medical Act, 1886, a number of medical diplomas granted in British possessions entitle their possessors to be registered without further examination in the Colonial List of the (British) Medical Register. The condition attached to such registration is that the holder of the colonial diploma obtained it when he was not domiciled in the United Kingdom or in the course of a period of not less than five years during the whole of which he resided out of the United Kingdom. Some account of these will be given in a later issue of THE LANCET.

THE M.D. BRUSSELS FOR STRANGERS.

THE examination is arranged in three parts. No conditions of residence are needed; the time required for the three examinations seldom exceeds 10 or 12 days, and candidates who are unable to be so long away from home may take each part separately. The examinations are conducted in English through the medium of an interpreter (without additional charge). They take place on the first Tuesday in November, December, March, and May, and the second Tuesday in June. They are *viva voce*, but candidates may have a written examination by paying an additional fee of £1 for each test. This does not exempt them from the *viva voce* examination. Part I. includes general medicine; materia medica and pharmacology; general surgery; and the theory of midwifery. Part II. includes general therapeutics; pathology and morbid anatomy, and the use of the microscope; special therapeutics and medicine of internal diseases; special surgery; and mental diseases. Part III. includes public and private hygiene; medical jurisprudence; clinical medicine; clinical surgery; examination in operative surgery, consisting of some of the usual operations on the dead subject—viz., amputation, ligature of artery, &c.; ophthalmology; examination in midwifery, consisting of obstetrical operation on the mannequin (model of pelvis), examination in regional anatomy with dissection; and bacteriology. The address of the Secretary of the Brussels Medical Graduates' Association is 41, Buckland-crescent, Hampstead, N.W. 3.

Annotations.

"Ne quid nimis."

OUR FOOD FROM THE SEA.

IN his presidential address, delivered before the British Association for the Advancement of Science, at Cardiff, at the opening meeting on August 24th, Professor Wm. A. Herdman took for his subject Oceanography and the Sea Fisheries. His studies in this direction as professor of oceanography in the University of Liverpool are well known, and they bear on the future of the supplies of food from the sea. He pointed out that edible animals of the shore may exist in such abundance that an area of the sea may be more productive of food than a similar area of pasture or crops on land. A Lancashire mussel bed, for example, has been shown to have as many as 16,000 young mussels per square foot, and it is estimated that in the shallow waters of Liverpool Bay there are from 20 to 200 animals of sizes varying from a sandhopper to a plaice on each square metre of the bottom. After giving an interesting history of fisheries Professor Herdman spoke on the vexed question of productivity of the trawling grounds, especially those of the North Sea. The enormous increase of fishing power during the last forty years or so had reduced the number of large plaice, so that the average size of that fish caught in our home waters had become smaller, although the total number of plaice landed had continued to increase up to the year of the outbreak of war. Since then from 1914 to 1919 there has been, as Professor Herdman pointed out, the most gigantic experiment ever made in fishery researches by the closing of fishing grounds forced upon us by marine warfare. The effect is so far uncertain, but there are indications of an increase in fish population in certain areas, possibly owing to this less intensive fishing. There may be a lesson in this fact. The problem is to obtain some approximation to a census or valuation of the sea—of the fishes that form the food of man, of the lower animals of the sea-bottom on which many of the fishes feed, and of the plankton or contents of the upper waters which form the ultimate organised food of the sea—and many attempts have been made towards attaining this desired end. Statistics, however, as to the millions of tons of possible food in a sea area are not quite reliable when the fact is considered, as Professor Herdman explained, that all food-fishes are not equally nourishing to man, and all plankton and bottom invertebrata are not equally nourishing to a fish. A fat summer herring differs in essential constitution from the ordinary white fish, such as the cod, which is almost destitute of fat. The assimilative and synthetic powers of fishes evidently differ. The point is emphasised that on these considerations the biologist requires the assistance of the physiologist and the bio-chemist. Our need, concluded Professor Herdman, is research, more research, and still more research. It is instructive to remember how the question of food-supply has occupied the minds of other scientific workers who have been elected to the distinguished post of president to the Association. We may recall Sir William Crookes's address before the Association at its meeting at Bristol in 1898, when he uttered his famous injunction that we should utilise the nitrogen of the air for fertilising purposes, and so increase the food-supply of the nation. That proposition has materialised, and great machinery is in progress for gaining nitrogen from the air and converting it into nitrate. War stimulated the process, which is now turned to the advantage of peace issues. The subject of fish supplies was referred to also in the address delivered at the Cardiff meeting by Professor J. Stanley Gardiner in the Zoological Section. He said, amongst other interesting things, that the abundance of mackerel is connected with the movements of Atlantic water into the British Channel and the North Sea, movements depending on complex astronomical, chemical,

and physical conditions. Their pabulum, as does ultimately that of all animals, resides in that living matter, which possesses chlorophyll for nutrition, commonly called plant. The plant life of the high seas consists of spores of algæ, diatoms, and the like, whose abundance as food depends, in its turn, on the amount of the light of the sun—the ultimate source of all life. The British Association is this year again giving evidence of the significance of the application of pure science to human affairs.

"HOSPITALS ON THE RATES."

THE whole hospital question is an urgent one, and how to deal with it wisely remains the most important medical matter of the moment. In our Parliamentary columns last week we gave in full the clauses of the Ministry of Health (Miscellaneous Provisions) Bill, which deal with the assistance from the rates which Dr. Addison proposes should be made available. A week ago immediate financial aid in respect of arrears of repairs and replacements, accumulated during five years of warfare, seemed terribly urgent. Two successive gifts of a quarter of a million each from the Red Cross organisations left this huge need untouched. The announcement early in the week of the allocation to this purpose of £700,000 from the National Relief Fund will serve to meet pressing liabilities and give a little time in which to look quietly round and study the claims of the voluntary system versus hospital municipalisation. There are some three months before Parliament will return to its deliberations. In the meantime, every medical man and every thoughtful citizen concerned with health problems should read the provisions of Dr. Addison's Bill in conjunction with the Dawson Report. There are possible dangers in the Bill which must be safeguarded. As Clause 11 stands it may conceivably enable public opinion to shelve any proper organisation of medical services by merely patching up the worst holes in the existing structure. Improper use of the power given in the Bill to county councils and county boroughs might lead them to special commitments, antagonistic and detrimental to the carrying out of a larger scheme. It is a matter for serious consideration whether it is wise to confirm councils in these powers until a proper health authority has been set up. The difficulty might be met by limiting the operation of the hospital clauses to one year, thus making it a strictly emergency measure. We feel very strongly that it is not really in the public interest to give such wide powers of control over hospitals to municipal bodies, unless some adequate way of expressing, and maybe of enforcing, its opinion is given to the medical profession. The Dawson Report emphasised the vital importance of a sufficient representation of medical men on the health authority, proposing that the medical advisory council for each area should nominate a certain number of medical men for coöption on the health authority. No one would wish to prevent enlightened municipalities from giving temporary grants to the hospitals within their area, but many people would prefer not to hand over to municipalities the power of building and controlling hospitals until after a general and well-considered policy has been formulated by Parliament.

THE LATE PROFESSOR POLITZER.

WITH Professor Adam Politzer, the report of whose death, at the age of 86, reaches us from Vienna, there has passed away the last of a brilliant group of investigators, scientists, and physicians who collaborated towards the end of the nineteenth century in making Vienna a great focus of medical teaching. Although associated in the faculty with Skoda, Billroth, Kaposi, and Turck, Politzer's clinic formed one of the chief attractions to students from all parts of both hemispheres. More than 7000 English and American doctors have taken special courses with this famous teacher. He was able to address them in their native tongue, and thus his ideas and his methods of research and treatment were easily assimilated. The clinic formed a veritable school for diseases of the ear, and the most prominent otologists on the continent—for example, Viktor Urbantschitch, Alexander, Neumann, and the Nobel prizeman Bárány—apart from numerous aurists in the United Kingdom and in the States, owe to Politzer the chief part of their training. A native of German Hungary and of Jewish origin, Adam Politzer early showed signs of an enterprising and original mind, for on his appointment as teacher at the University of Vienna in 1861, at the early age of 26, he had previously published important papers on experimental physiology dealing with the innervation of the muscles of the inner ear and the pressure conditions of the labyrinth; he had already studied physiology with Helmholtz and with Claude-Bernard, acoustics with König in Paris, and pathology with Toynbee in London. "The paw of the lion became visible," said his old teacher, Oppolzer. Politzer's method of air inflation into the drum cavity was first published in 1863; politzerisation with a small "p" now appears in the dictionary. In 1870 Politzer was appointed to the chair of otology in Vienna, which he held for 37 years, and was acknowledged as the greatest teacher of his subject almost throughout that period. His collection of anatomical and pathological specimens now revert to his old clinic, whilst his library has been bequeathed to the University of Vienna. It is given to few medical men to develop a threefold claim to a place in the history of medicine. Professor Politzer himself built up a new science, applied his own inventions and discoveries with the utmost technical skill, and did not scorn to spend many hours in each day for four decades in expounding, demonstrating, and teaching. He founded a great school of otology, and his name will never be forgotten.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE.

MEDICAL UNIT, in the Clinical Theatre of the London Hospital, E.

MONDAY, August 30th.—2 P.M., Mr. Goulden: Eye Conditions in General Diseases of the Central Nervous System.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, August 30th.—2 P.M., Dr. G. Stewart: Medical Out-patients. 2 P.M., Mr. D. Armour: Operations.

TUESDAY.—10 A.M., Mr. Steadman: Dental Department. 2 P.M., Dr. Burnford: Medical Out-patients.

WEDNESDAY.—2 P.M., Mr. Addison: Operations. 2 P.M., Mr. Gibb: Eye Department.

THURSDAY.—2 P.M., Mr. MacDonald: Surgical Out-patients. 2 P.M., Mr. Sinclair: Orthopædic Department.

FRIDAY.—2 P.M., Mr. Banks Davis: Diseases of the Throat, Nose, and Ear. 2 P.M., Dr. Burnford: Medical Out-patients.

SATURDAY.—10 A.M., Dr. A. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients.

Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.

MONDAY, August 30th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

Births, Marriages, and Deaths.

MARRIAGES.

EARP—GOODLIFFE.—On August 18th, at Mansfield-road Baptist Church, Nottingham, John Rosslyn Earp, M.A., M.R.C.S., L.R.C.P., to Kathleen May Goodliffe.

WEBSTER—BENTLEY.—At St. John's Church, Old Trafford, Manchester, on the 14th August, 1920, by Rev. C. S. Jackson, Clement Arthur Webster, M.R.C.S., L.R.C.P., of 216, Upper Chorlton-road, Whalley Range, Manchester, to Doris Anne Marie, elder daughter of Ernest J. Bentley, Esq., of "Waltham," Wood-lane, Timperley.

DEATHS.

LEDINGHAM.—On July 22nd, on s.s. *Mogilov*, Christie William Ledingham, M.D., F.R.C.S. Buried at sea, Gulf of Suez.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Sir Shirley Murphy has been elected Master of the Society of the Apothecaries of London.

Presidential Address

[ABRIDGED]

ON

ANOXÆMIA.

Delivered before the Physiological Section of the British Association for the Advancement of Science

BY JOSEPH BARCROFT, C.B.E., M.A., F.R.S.,

PRESIDENT OF THE SECTION AND SENIOR DEMONSTRATOR IN PHYSIOLOGY, CAMBRIDGE UNIVERSITY.

LADIES AND GENTLEMEN,—The sentence which lives in my mind as embodying the problem of anoxæmia comes from the pen of one who has given more concentrated thought to the subject than perhaps any other worker—Dr. J. S. Haldane.[1] It runs, "Anoxæmia not only stops the machine but wrecks the machinery." This phrase puts the matter so clearly that I shall commence by an inquiry as to the limits within which it is true.

Anything like complete anoxæmia stops the machine with almost incredible rapidity. It is true that the breath can be held for a considerable time, but it must be borne in mind that the lungs have a volume of about three litres at any moment, that they normally contain about half a litre of oxygen, and that this will suffice for the body at rest for upwards of two minutes. But get rid of the residual oxygen from the lungs only to the very imperfect extent which is possible by the breathing of some neutral gas, such as nitrogen, and you will find that only with difficulty will you endure half a minute. Yet even such a test gives no real picture of the impotence of the machine—which is the brain—to "carry on" in the absence of oxygen. For, on the one hand, nearly a quarter of a minute elapses before the reduced blood gets to the capillary in the brain, so that the machine has only carried on for the remaining quarter of a minute; on the other hand, the arterial blood under such circumstances is far from being completely reduced—in fact, it has very much the composition of ordinary venous blood, which means that it contains about half its usual quota of oxygen. It seems doubtful whether complete absence of oxygen would not bring the brain to an instantaneous standstill. So convincing are the experimental facts to anyone who has tested them for himself that I will not further labour the power of anoxæmia to stop the machine. I will, however, say a word about the assumption which I have made that the machine in this connexion is the brain.

It cannot be stated too clearly that anoxæmia in the last resort must affect every organ of the body directly. Stoppage of the oxygen supply is known, for instance, to bring the perfused heart to a standstill, to cause a cessation of the flow of urine, to produce muscular fatigue, and at last immobility, but from our present standpoint these effects of anoxæmia seem to me to be out of the picture, because the brain is so much the most sensitive to oxygen-want. Therefore, if the problem is the stoppage of the machine due to an insufficient general supply of oxygen, I have little doubt that the machine stops because the brain stops, and here at once I am faced with the question how far is this assumption and how far is it proven fact? I freely answer that research in this field is urgent; at present there is too great an element of assumption, but there is also a certain amount of fact.

ACUTE ANOXÆMIA.

To what extent does acute anoxæmia in a healthy subject wreck the machinery as well as stop the machine? By acute anoxæmia I mean complete or almost complete deprivation of oxygen which, in the matter of time, is too short to prove fatal. It is not easy to obtain quite clear-cut experiments in answer to the above question. No doubt many data might be quoted of men who have recovered from drowning, &c. Such data are complicated by the fact that anoxæmia has only been a factor in their condition; other factors, such as accumulation of carbonic acid, may also have contributed to it. The remarkable fact about most of them, however, is the slightness of the injury which the machine has suffered. These data, therefore, have a value in so far as they show that a very great degree of anoxæmia, if acute and of short duration, may be experienced with but little wreckage to the machine. They have but little value in showing that such wreckage is due to the anoxæmia, because the anoxæmia has not been the sole disturbance. Of such cases I will quote two.

The first is that of a pupil of my own who received a gunshot wound in the head, to the prejudice of his cerebral circulation. I can give you the most perfect assurance that neither intellectually nor physically has the catastrophe which befell him caused any permanent injury. For the notes of the case I am indebted to Colonel Sir William Hale White.

My pupil fell wounded at 6.50 A.M. on Nov. 20th, 1917. As far as is known, he lay insensible for about two hours. Picked up five hours after the wound, he could not move either upper or lower extremity. Thirty-six hours after the wound he underwent an operation, which showed that the superior sagittal sinus was blocked, happily not by a thrombus, but by being torn and having pieces of the inner table of the skull thrust into it, so that for this period of time the motor areas on both sides down to the face area were asphyxiated, the right being much more affected than the left. Six days after the wound the cerebration was still slow, with typically vacant look.

In the left upper extremity the muscular power was much improved; he could raise his arm to his mouth, but he preferred to be fed. In the right upper extremity there were no movements in the shoulder, elbow, or wrist, but he could flex and extend the fingers weakly. In the left lower extremity there were fair movements of hip and knee; no movements of ankle and toes. In the right lower extremity there were no movements of hip, knee, ankle, or toes.

Six weeks after the wound he first walked, although with difficulty; absolutely the last place in which the paresis remained was in the muscles of the right toes. Four months after the injury these toes were spread out and could not be brought together voluntarily. Gradually this has become less, but even now, two and a half years later, all these muscles are weaker than those on the other side.

Such, then, is the wreckage of the machine caused by 36 hours' blockage of the blood flow through the motor areas of the brain; wreckage enough, but not irreparable.

I pass to the second case. It is that of the child of a well-known professor of physiology and a first authority on the subject of respiration. I am indebted to him for the following notes:—

In this child, a male twin, born about 12 weeks too early, it was noticed about 24 hours after birth that the breathing during sleep was irregular and of a very pronounced Cheyne-Stokes type, six to ten breaths being followed by a pause during which no respiratory movement occurred. Usually the pauses were of 15 to 20 seconds' duration, but occasionally (two to ten times a day) the breathing remained suspended for a prolonged period, extending in some cases to 10 and 15 minutes, and in one accurately observed case even to 25 minutes, interrupted by one single breath and a cry about the middle of the period. The breathing invariably started again before the heart beats ceased.

Cases in which the anoxæmia has been uncomplicated are to be found among those who have been exposed to low atmospheric pressures; for instance, balloonists and aviators. Of these quite a considerable number have suffered from oxygen-want to the extent of being unconscious for short intervals of time. No scientific observer has pushed a general condition of anoxæmia either on himself or on his fellows to the extent of complete unconsciousness. The most severe experiments of this nature are those carried out by Haldane and his colleague. One experiment in particular demands attention.

Dr. Haldane and Dr. Kellas[2] together spent an hour in a chamber in which the air was reduced to between 320 and 295 mm. It is difficult to say how far they were conscious. Clearly each believed the other to be complete master of his own faculties, but it is evident that Dr. Haldane was not so. I gather that he has no recollection of what took place; that whenever he was consulted about the pressure he gave a stereotyped answer which was the same for all questions; that, even with a little more oxygen present, he was sufficiently himself to wish to investigate the colour of his lips in the glass, but insufficiently himself to be conscious that he was looking into the back and not the front of the mirror. Dr. Kellas, who could make observations, never discovered Dr. Haldane's mental condition, though boxed up with him for an hour, and went on consulting him automatically. A somewhat similar experiment was performed on the other two observers, with results differing only in degree.

"Yet the after-effects are summed up in the following sentence: "All four observers suffered somewhat from headache for several hours after these experiments, but there was no nausea or loss of appetite."

Of real importance in this connexion are the results of carbon monoxide poisoning. Of these a large number

might be cited. Those interested will find some very instructive cases described in a volume entitled "The Investigation of Mine Air," by the late Sir C. Le Neve Foster and Dr. Haldane.[3] The cases in question were those of a number of officials who went to investigate the mine disaster on Snaefell, in the Isle of Man, in May, 1897. Of the five cases cited all suffered some after-effects, by which I mean that by the time the blood was restored sufficiently to its normal condition for the tissues to get the amount of oxygen which they required, the effects of the asphyxia had not passed off and to this extent the machine suffered.

To sum up, then, what may be said of the permanent damage caused by acute anoxæmia, it seems to me to be as follows: No degree of anoxæmia which produces a less effect than that of complete unconsciousness leaves anything more than the most transient effects; if the anoxæmia be pushed to the point at which the subject is within a measurable distance of death the results may take days or weeks to get over, but only in the case of elderly or unsound persons is the machine wrecked beyond repair.

CHRONIC ANOXÆMIA.

And now to pass to the consideration of what I may call chronic anoxæmia—that is to say, oxygen-want which perhaps is not very great in amount—and I shall have to say something later about the measurement of anoxæmia in units, but which is continued over a long time—weeks, months, or perhaps years. We have to ask ourselves, how far does chronic anoxæmia stop the machinery; how far does it wreck the machine? Here we are faced with a much more difficult problem, for the distinction between stopping the machinery and wrecking the machine tends to disappear. In fact, so indistinct does it become that you may ask yourself, with some degree of justice, does chronic anoxæmia stop the machine in any other way than by wrecking it?

The most obvious instances of men subject to chronic anoxæmia are the dwellers at high altitudes. Now, it is quite clear that in many instances of mountain-dwellers the anoxæmia does not wreck the machine. On what I may call the average healthy man anoxæmia begins to tell at about 18,000 feet. At lower altitudes no doubt he will have some passing trouble, but it seems to me from my own experience that this altitude is a very critical one. Yet there are mining camps at such heights in South America at which the work of life is carried on. Under such circumstances the machine is kept going by a process of compensation. This is in part carried out by a modification in the chemical properties of the blood. It would appear that both the carbonic acid in the blood and the alkali diminish. The result, according to my interpretation of my own observations on the Peak of Teneriffe, which appeared to be confirmed by the experiments in a chamber in Copenhagen[4] from which the air was partially exhausted, was this: the hydrogen-ion concentration of the blood increased slightly, the respiratory centre worked more actively, and the lung became better ventilated with oxygen, with the natural result that the blood became more oxygenated than it would otherwise have been. The difference which this degree of acclimatisation made was very great. Take as an example one of my colleagues, Dr. Roberts.

On Monte Rosa in his case, as in that of the rest of the party, 15 mm. of oxygen pressure were gained in the lungs. To put the matter another way, the amount of oxygen in our lungs at the summit was what it would otherwise have been 5000 or 6000 feet lower down. No actual analyses of the oxygen in Roberts's arterial blood were made, but from what we now know it seems probable that his blood was about 82 per cent. saturated—that is to say, that for every 100 g. of hæmoglobin in the blood 82 were oxyhæmoglobin and 18 reduced hæmoglobin; had this degree of acclimatisation not taken place his blood would have contained as many as 38 parts of unoxidised hæmoglobin out of every 100, and this would probably have made all the difference between the machine stopping and going on.

The body, then, had fought the anoxæmia and reduced it very much in degree, but at the same time the anoxæmia had in a subtle way done much to stop the powers of the body, for this very acclimatisation is effected at the expense of the ultimate reserve which the body has at its disposal for the purpose of carrying out muscular or other work. The oxygen in the lungs was obtained essentially by breathing at rest as you would normally do when taking some exercise. Clearly, then, if you are partly out of breath before you commence exercise you cannot undertake so much as you otherwise would do. As a friend of mine, who has, I believe, camped at a higher altitude than any other man, put it to me, "So great was the effort that we thought twice before we turned over in bed."

One of the interesting problems with regard to chronic anoxæmia is its effect upon the mind. The whole train of symptoms of CO poisoning strongly suggests some form of intoxication, and is not dissimilar to that produced by alcoholic excess. Here it may be noted that, as far as isolated nerves are concerned, there is pretty good evidence that alcohol and want of oxygen produce exactly the same effects—i.e., they cause a decrement in the conducting power of the nerve. And herein lies a part of its interest, for pharmacologists of one school, at all events, tell me that the corresponding effects of alcohol are really due to an inhibition of the higher centres of the mind; you can therefore conceive of the mental mechanism of self-control being knocked out either because it has not oxygen enough with which to "carry on," or because it is drugged by some poison as a secondary result of the anoxæmia.

Turning to the results of more chronic anoxæmia. If I were to try to summarise them in a sentence I should say that, just as acute anoxæmia simulates drunkenness, chronic anoxæmia simulates fatigue. Another symptom frequently associated with mental fatigue is irritability. Anyone who has experience of high altitudes knows to his cost that life does not run smoothly at 10,000 feet. If the trouble is not with one's own temper it is with those of one's colleagues; and so it was in many cases of gas-poisoning and in the case of aviators.

TYPES OF ANOXÆMIA.

And now to pass to the consideration of the various types of anoxæmia. Anoxæmia is by derivation want of oxygen in the blood. Suppose you allow your mind to pass to some much more homely substance than oxygen—such, for instance, as milk—and consider the causes which may conspire to deprive your family of milk, three obvious sources of milk deficiency will occur to you at once: (1) There is not enough milk at the dairy; (2) the milk is watered or otherwise adulterated so that the fluid on sale is not really all milk; and (3) the milkman from that particular dairy does not come down your road. These three sources of milk deficiency are typical of the types of oxygen deficiency.

The first is insufficient oxygen dispensed to the blood by the lungs. An example of this type of anoxæmia is mountain-sickness. The characteristic of it is insufficient *pressure* of oxygen in the blood. In mountain-sickness the insufficiency of pressure in the blood is due to insufficient pressure in the air, for, according to our view at all events, the pressure in the blood will always be less than that in air. But this type of anoxæmia may be due to other causes. The sufferer may be in a normal atmosphere, yet for one reason or another the air may not have access to his whole lung. In such cases, either caused by obstruction, by shallow respiration, or by the presence of fluid in the alveoli, the blood leaving the affected areas will contain considerable quantities of reduced hæmoglobin. This will mix with blood from unaffected areas which is about 95 per cent. saturated. The oxygen will then be shared round equally among the corpuscles of the mixed blood, and if the resultant is only 85-90 per cent. saturated the pressure of oxygen will only be about half the normal, and, as I said, deficiency of oxygen pressure is the characteristic of this type of anoxæmia.

The second type involves no want of oxygen pressure in the arterial blood; it is comparable to the watered milk; the deficiency is really in the quality of the blood and not in the quantity of oxygen to which the blood has access. The most obvious example is anæmia, in which from one cause or other the blood contains too low a percentage of hæmoglobin, and because there is too little hæmoglobin to carry the oxygen too little oxygen is carried. Anæmia is, however, only one example which might be given of this type of anoxæmia. There may be sufficient hæmoglobin in the blood, but the hæmoglobin may be useless for the purpose of oxygen transport; it may be turned in part into methæmoglobin, as in several diseases—e.g., among workers in the manufacture of some chemicals, and in some forms of dysentery contracted in tropical climates, or it may be monopolised by carbon monoxide, as in mine air.

Thirdly, the blood may have access to sufficient oxygen and may contain sufficient functional hæmoglobin, but owing to transport trouble it may not be circulated in sufficient quantities to the tissues. The quantity of oxygen which reaches the tissue in unit time is too small. Literally, according to the strict derivation of the word "anoxæmia," the third type should perhaps be excluded from the category of conditions covered by that word, but, as the result is oxygen starvation in the tissues, it will be convenient to include it. Indeed, it would be an act of pedantry not to do so, for no form of anoxæmia has any significance apart from the fact that it prevents the tissues from obtaining the supply of oxygen requisite for their metabolic processes.

The obvious types of anoxæmia may therefore be classified in some such scheme as the following, and, as it is difficult to continue the discussion of them without some sort of nomenclature, I am giving a name to each type:—

ANOXÆMIA.

1. *Anoxic Type.*	2. *Anæmic Type.*	3. *Stagnant Type.*
The pressure of oxygen in the blood is too low. The hæmoglobin is not saturated to the normal extent. The blood is dark. Examples: (1) Rare atmospheres; (2) areas of lung partially unventilated; (3) fluid or fibrin on surface of cells.	The quantity of functional hæmoglobin is too small. The oxygen pressure is normal. The blood is normal in colour. Examples: (1) Too little hæmoglobin; (2) CO hæmoglobin; (3) methæmoglobin.	The blood is normal, but is supplied to the tissues in insufficient quantities. Examples: (1) Secondary result of histamine shock; (2) hæmorrhage; (3) back pressure.

Anoxic anoxæmia is essentially a general as opposed to a local condition. Not only is the pressure of oxygen in the blood too low, but the lowness of the pressure and not the deficiency in the quantity is the cause of the symptoms observed. Proof of the above statement is to be found in the researches of most workers who have carried out investigations at low oxygen pressures, and it can now be brought forward in a much more convincing way than formerly that oxygen secretion is, for the time at all events, not a factor to be counted with.

The workers on Pike's Peak, for instance, emphasised the fact that the increase of red blood corpuscles during their residence at 14,000 feet was due to deficient oxygen pressure. No doubt they were right, but the point was rather taken from their argument by their assertion in another part of the paper that the oxygen pressure in their arterial blood was anything up to about 100 mm. of mercury. Let me therefore take my own case, in which the alveolar pressures are known to be an index of the oxygen pressures in the arterial blood. I will compare my condition on two occasions, the point being that on these two occasions the quantities of oxygen united with the hæmoglobin were as nearly as may be the same, whilst the pressures were widely different. As I sit here the hæmoglobin value of my blood is 96–97, which corresponds to an oxygen capacity of 0·178 c.cm. of O_2 per cubic centimetre of blood. In the oxygen chamber on the last day of my experiment, to which I refer later,[5] the oxygen capacity of my blood was 0·201 c.cm. Assuming the blood to be 95 per cent. saturated now and 84 per cent. saturated then, the actual quantity of oxygen in the blood on the two occasions would be—

Oxygen capacity.	Percentage saturation.	Oxygen content.
0·178	95	0·169
0·201	84	0·169

Here I am in my usual health. In the chamber I vomited, my pulse was 86—it is now 56; my head ached in a most distressing fashion, it was with the utmost difficulty that I could carry out routine gas analyses, and when doing so the only objects which I saw distinctly were those on which my attention was concentrated.

In the anoxic type of anoxæmia there may then be quite a sufficient quantity of oxygen in the blood, but a sufficient quantity does not avail in the face of an insufficient pressure. Indeed, as I shall show presently, the anoxic type of anoxæmia is the most serious. We are therefore confronted with something of a paradox in that the most severe type of anoxæmia is one in which there is not necessarily an insufficient quantity of oxygen in the blood at all. And here let me justify the statement that the anoxic type is the most to be feared. I can justify it on either or both of two grounds. Firstly, of the three types it places the tissues at the greatest disadvantage as regards oxygen supply, and, secondly, it is of the three the least easy type for the organism to circumvent.

Let me dwell for a moment upon the efficiency of the blood as a medium for the supply of oxygen to the tissue in the three types. The goal of respiration is to produce and maintain as high an oxygen pressure in the tissue fluids as possible. For the velocity of any particular oxidation in the tissues must depend upon the products of the concentrations (active masses) of the material to be oxidised and of the oxygen. Now the concentration of oxygen in the tissue is proportional to its partial pressure, and the highest partial pressure in the tissue must, other things being equal, be the result of that type of anoxæmia in which there is the highest partial pressure in the blood plasma.

It is interesting and not uninstructive to try to calculate the degree to which the tissues are prejudiced by being subjected to various types of anoxæmia. Let us suppose that we have a piece of tissue, muscle for instance, which normally is under the following conditions: (*a*) One cubic centimetre of blood per minute runs through it. (*b*) The total oxygen capacity of this blood is 0·188 c.cm. of oxygen per cubic centimetre of blood. (*c*) The percentage saturation is 97. (*d*) The oxygen pressure is 100 mm. (*e*) The oxygen used is 0·059 c.cm. (*f*) The oxygen pressure in the tissues is half of that in the veins, in this case 19 mm.

Compare with this a severe case of anoxic anoxæmia, one in which the blood flow is the same as above, and also the oxygen capacity value of the blood, but in which the oxygen pressure is only 31 mm. and the percentage saturation of the arterial blood 66 per cent. Let us, further, retain the assumption that the oxygen pressure in the tissues is half that in the veins. It is possible to calculate, as indeed has been done by my colleague, Mr. Roughton, what the amount of oxygen leaving the capillaries is. The answer is not 0·059, as in the case of the normal, but 0·026—less than half the normal. So, other things being equal, cutting down the oxygen pressure in the arterial blood to 31 and the percentage saturation to 66 would deprive the tissues of half their oxygen. With this compare an example of the anæmic type. The arterial blood shall have the same total quantity of oxygen as in the anoxic case, but instead of being 66 per cent. saturated it shall contain 66 per cent. of the total hæmoglobin, which shall be normally saturated. The amount of oxygen which would pass to the tissues under these conditions is 0·041 c.cm.—more than half as much again as from the anoxic blood laden with the same quantity of oxygen.

And thirdly, let us take for comparison a case of stagnant anoxæmia in which the same quantity of oxygen goes to the tissue in the cubic centimetre of blood as in the anoxic and anæmic types. On the assumption which we have made the quantity of oxygen which would leave the blood would be 0·045 c.cm.

In round numbers, therefore, the prejudice to the tissues may be expressed by the following comparison. In this case both of the oxygen going to the blood and going into the tissues I have called the normal 100. This does not, of course, mean that the two amounts are the same. The former in absolute units is about three times the latter. The figure 100 at the top of each column is merely a standard with which to compare the figures beneath it.

		Oxygen in blood going to vessels of tissue.	Oxygen leaving the blood to supply the tissues.
Normal		100 per cent.	100 per cent.
Anoxæmia	Anoxic	66 ,,	42 ,,
	Anæmic	66 ,,	66 ,,
	Stagnant	66 ,,	75 ,,

MEASUREMENT OF ANOXÆMIA.

By what scale are we to measure oxygen-want? Let us take the anoxic type first. There are two scales which might be applied to it; both concern the arterial blood; the one is the oxygen pressure in it, the other is the actual percentage of the hæmoglobin which is oxyhæmoglobin. A third possibility suggests itself—namely, the actual amount of oxygen present, but this would be influenced as much by the anæmic as by the anoxic conditions. Of the two possibilities—that of measuring the pressure, and that of measuring the saturation of the blood with oxygen—the latter is the one which is likely to come into vogue, because it is susceptible of direct measurement.

Two converging lines of work have within the last few years brought us nearer to being able to state the degree of anoxæmia in man in terms of the percentage

saturation of oxygen in his blood. The first, introduced by the American researcher Stadie,[6] is the method of arterial puncture. The needle of a hypodermic syringe can be put right into the radial artery and arterial blood withdrawn. I am not sure that the operation is less painful than that of dissecting out the radial artery and opening it—and in this matter I speak with experience—but it is less alarming, and it has the great merit that it does not injure the artery.

Another method of determining the percentage saturation of arterial blood has invited the attention of researchers. That method is to deduce the percentage saturation from the composition of the alveolar air. Into the merits of the rival methods for the determination of the oxygen in alveolar air I will not go; the method of Haldane and Priestley will suffice for persons at rest. Granted, then, that a subject has a partial pressure of 50 mm. of oxygen in his alveolar air, what can we infer as regards his arterial blood? A long controversy has raged about whether or no any assumption could be made about the condition of the arterial blood from that of the alveolar air, for it was an article of faith with the school of physiologists which was led by Haldane that when the oxygen pressure in the alveolar air sank the oxygen in the arterial blood did not suffer a corresponding reduction. The experimental evidence at present points in the opposite direction, and unless some further facts are brought to light it may be assumed that the oxygen pressure in the arterial blood of a normal person at rest is some 5 mm. below that in his alveolar air. And having obtained a figure for the pressure of oxygen in the arterial blood, where do we stand as regards the percentage saturation? The relation between the one and the other is known as the oxygen dissociation curve. It differs but slightly in normal individuals, and at different times in the same individual. To infer the percentage saturation from the oxygen pressure no doubt the actual dissociation curve should be determined, but in practice it is doubtful whether as a first approximation this is necessary, for a curve determined as the result of a few observations is unlikely to be much nearer the mark than a standard curve on which 20 or 30 points have been determined. Therefore an approximation can be made for the percentage saturation as follows: In a normal individual take the oxygen in the alveolar air, subtract 5 mm., and lay the result off on the mean dissociation curve for man.

Whether measured directly or indirectly, the answer is a statement of the relative quantities of oxyhæmoglobin and of reduced hæmoglobin in the arterial blood. The important thing is that there should be as little reduced hæmoglobin as possible. The more reduced hæmoglobin there is present the less saturated is the blood, or, as the American authors say, the more *un*saturated is the blood. They emphasise the fact that it is the quantity of reduced hæmoglobin that is the index of the anoxic condition. They speak not of the percentage saturation, but of the percentage of unsaturation. A blood which would ordinarily be called 85 per cent. saturated they speak of as 15 per cent. unsaturated.

Anoxic anoxæmia, in many cases of lung affection, should be measured by the direct method of arterial puncture, for the simple reason that the relation between the alveolar air and the arterial blood is quite unknown. Such, for instance, are cases of many lung lesions of pneumonia in which the lung may be functioning only in parts, of pneumothorax, of pleural effusions, of emphysema, of multiple pulmonary embolism, in phases of which the arterial blood has been found experimentally to be unsaturated. In addition to these definite lung lesions, there is another type of case on which great stress has been laid by Haldane, Meakins, and Priestley—namely, cases of shallow respiration.[7] A thorough investigation of the arterial blood in such cases is urgently necessary. Indeed, in all cases in which it is practicable, the method of arterial puncture is desirable. But in the case of many normal persons—such, for instance, as that of airmen at different altitudes—alveolar-air determinations would give a useful index.

The anæmic type of anoxæmia is gauged by the quantity of oxyhæmoglobin in the blood. In the case of simple anæmias this is measured by the scale in which the normal man counts as 100, and the hæmoglobin in the anæmic individual is expressed as a percentage of this. This method has been standardised carefully by Haldane, and we now know that the man who shows 100 on the scale has an oxygen capacity of 0·185 c.cm. of oxygen for every cubic centimetre of blood. We can, therefore, in cases of carboxyhæmoglobin, or methæmoglobin poisoning, express the absolute amount of oxyhæmoglobin pressure either by stating the oxygen capacity and so getting an absolute measurement, or in relative units by dividing one hundred times the oxygen capacity by 0·185, and thus getting a figure on the ordinary hæmoglobin metre scale.

MECHANISM OF ANOXÆMIA.

Perhaps the most difficult phase of the discussion is that of how anoxæmia produces its baneful results. In approaching this part of the subject I should like to warn my readers of one general principle, the neglect of which seems to be responsible for a vast dissipation of energy. Before you discuss whether a certain effect is due to cause A or cause B, be clear in your own mind that A and B are mutually exclusive.

Let me take an example and suppose

(1) That the energy of muscular contraction in the long run depends in some way on the oxidation of sugar;

(2) That in the absence of an adequate supply of oxygen, the reaction $C_6H_{12}O_6 + 6O_2 = 6CO_2 + 6H_2O$ cannot take place in its entirety;

(3) That under such circumstances some lactic acid is formed as well as carbonic acid;

(4) That the hydrogen-ion concentration of the blood rises and the total ventilation increases. On what lines are you to discuss whether the increased ventilation is due to "acidosis," by which is meant in this connexion the increased hydrogen-ion concentration of the blood, or to "anoxæmia"? Clearly not on the lines that it must be due to one or other.

In the above instance anoxæmia and acidosis are, to some extent, dependent variables. I have chosen the above case because measurements have been made throughout which make the various assumptions fairly certain, and tell us pretty clearly in what sort of chain to string up the events, what is cause and what is effect. Clearly it would be ridiculous to start a discussion as to whether the breathlessness was due to "acidosis" or "anoxæmia." Each has its place in the chain of events. But I have heard discussions of whether other phenomena of a more obscure nature were due to oxygen-want or to acidosis. Such discussions tend to no useful end.

Nor is this the only problem with regard to oxygen-want, concerning which my warning is needed. Oxygen-want may act immediately in at least two ways:—

(1) In virtue of absence of oxygen some oxidation which otherwise might take place does not do so, and therefore something which might otherwise happen may not happen. For instance, it may be conceived that the respiratory centre can only go through the rhythmic changes of its activity as the result of the oxidation of its own substance.

(2) A deficient supply of oxygen may produce, not the negation of a chemical action, but an altered chemical action which in its turn produces toxic products that have a secondary effect on such an organism as the respiratory centre.

Now these effects are not mutually exclusive. In the same category are many arguments about whether accumulations of carbonic acid act specifically as such or merely produce an effect in virtue of their effect on the hydrogen-ion concentration. Here, again, the two points of view are not, strictly speaking, alternatives, and, in some cases at all events, both actions seem to go on at the same time.

It will be evident that in any balanced action in which CO_2 is produced its accumulation will tend to slow the reaction; but, on the other hand, the same accumulation may very likely raise the hydrogen-ion concentration, and in that way produce an effect.

The relation of oxygen to hæmoglobin seems to furnish a case in point. Carbonic acid is known to reduce the affinity of hæmoglobin for oxygen, and other acids do the same. On analogy, therefore, it might have, and has, been plausibly argued that CO_2 acts in virtue of the change in reaction which it produces. Put into mathematical language, the relation of the percentage saturation of oxygen to the oxygen pressure of the gas dissolved in the hæmoglobin solution is expressed by the equation

$$\frac{y}{100} = \frac{Kx^n}{1 + Kx^n} = \frac{x^n}{L + x^n}$$

where $L = 1/K$, where y is the percentage saturation and x the oxygen pressure. The value of K is the measure of the affinity of oxygen for hæmoglobin; the

less the value of K the less readily do the two substances unite.

Now 1/K has been shown by Laurence J. Henderson,[8] and independently by Adair, to vary directly with the concentration of CO_2. The value of this constant is, according to Henderson, too great to be a direct effect of the CO_2 on the hæmoglobin, and involves as well the assumption that the hæmoglobin in blood is in four forms—an acid and a salt of reduced hæmoglobin and an acid and a salt of oxyhæmoglobin. The presence of CO_2 alters the balance of these four substances.

It is rather fashionable at present to say that "the whole question of acidosis and anoxæmia is in a hopeless muddle." The "muddle," in so far as it exists, is not, I think, by any means hopeless; but I grant freely enough that we are rather at the commencement than at the end of the subject, that much thought and much research must be given, firstly, in getting accurate data, and, secondly, on relating cause and effect, before the whole subject will seem simple. No effort should be spared to replace indirect by direct measurements. My own inference with regard to changes of the reaction of the blood, based on interpretations of the dissociation curve, should be checked by actual hydrogen-ion measurements, as has been done by Hasselbach and is being done by Donegan and Parsons.[9] Meakins also is, I think, doing great work by actually testing the assumptions made by Haldane and himself as regards the oxygen in arterial blood.

COMPENSATIONS FOR ANOXÆMIA.

For the anoxic type of anoxæmia two forms of compensation at once suggest themselves. The one is increased hæmoglobin in the blood; the other is increased blood flow through the tissues. To go back to the extreme anoxic case already cited, in which the hæmoglobin was 66 per cent. saturated, let us, firstly, see what can be accomplished by an increase of the hæmoglobin value of the blood. Such an increase takes place, of course, at high altitudes. Let us suppose that the increase is on the same grand scale as the anoxæmia, and that it is sufficient to restore the actual quantity of oxygen in 1 c.cm. of blood to the normal. This, of course, means a rise in the hæmoglobin value of the blood from 100 to 150 on the Gowers's scale. Yet even so great an increase in the hæmoglobin will only increase the oxygen taken up in the capillary from each c.cm. of blood from 0·031 to 0·036 c.cm., and will therefore leave it far short of the 0·06 c.cm. which every cubic centimetre of normal blood was giving to the tissue. So much, then, for increased hæmoglobin. It gives a little, but only a little, respite. Let us turn, therefore, to increased blood flow.

In the stagnant type of anoxæmia the principal change which is seen to take place is an increase in the quantity of hæmoglobin per cubic millimetre of blood.

This increase is secondary to a loss of water in the tissues, the result in some cases, as appears from the work of Dale, Richards, and Laidlaw,[10] of a formation of histamine in the tissues. But, so far as the evidence available at the present time can teach any lesson, that lesson is this: The only way of dealing satisfactorily with the anoxic type of anoxæmia is to abolish it by in some way supplying the blood with oxygen at a pressure sufficient to saturate it to the normal level.

It has been maintained strenuously by the Oxford school of physiologists that Nature actually did this; that when the partial pressure in the air-cells of the lung was low the cellular covering of that organ could clutch at the oxygen and force it into the blood at an unnatural pressure, creating a sort of forced draught. This theory, as a theory, has much to recommend it. I am sorry to say, however, that I cannot agree with it on the present evidence. I will only make a passing allusion to the experiment which I performed in order to test the theory, living for six days in a glass respiration chamber in which the partial pressure of oxygen was gradually reduced until it was at its lowest—about 45 mm. Such a pressure, if the lung was incapable of creating what I have termed a forced draught, would mean an oxygen pressure of 38–40 mm. of mercury in the blood, a change sufficient to make the arterial blood quite dark in colour, whereas, did any considerable forced draught exist, the blood in the arteries would be quite bright in colour. Could we but see the blood in the arteries, its appearance alone would almost give the answer as to whether or no oxygen was forced, or, in technical language, secreted, through the lung wall. And, of course, we could see the blood in the arteries by the simple process of cutting one of them open and shedding a little into a closed glass tube. To the surgeon this is not a difficult matter, and it was, of course, done. The event showed that the blood was dark, and the most careful analyses failed to discover any evidence that the body can force oxygen into the blood in order to compensate for a deficiency of that gas in the air.

Yet the body is not quite powerless. It can, by breathing more deeply, by increasing the ventilation of the lungs, bring the pressure of oxygen in the air-cells closer to that in the atmosphere breathed than would otherwise be the case. I said just now that the oxygen in my lungs dropped to a minimal pressure of 45 mm.; but it did not remain at that level. When I bestirred myself a little it rose, as the result of increased ventilation of the lung, to 56 mm., and at one time, when I was breathing through valves, it reached 68 mm. Nature will do something, but what Nature does not do should be done by artifice. Exploration of the condition of the arterial blood is only in its infancy, yet many cases have been recorded in which in illness the arterial blood has lacked oxygen as much as or more than my own did in the respiration chamber when I was lying on the last day, with occasional vomiting, racked with headache, and at times able to see clearly only as an effort of concentration. A sick man, if his blood is as anoxic as mine was, cannot be expected to fare better as the result, and so he may be expected to have all my troubles in addition to the graver ones which are, perhaps, attributable to some toxic cause. Can he be spared the anoxæmia? The result of our calculations, so far, points to the fact that the efficient way of combating the anoxic condition is to give oxygen. During the war it was given with success in the field in cases of gas-poisoning, and also special wards were formed on a small scale in this country in which the level of oxygen in the atmosphere was kept up to about 40 per cent., with great benefit to a large percentage of the cases. The practice then inaugurated is being tested at Guy's Hospital by Dr. Hunt, who administered the treatment during the war.

Nor are the advantages of oxygen respiration confined to pathological cases. One of the most direct victims of anoxic anoxæmia is the airman who flies at great heights. Everything in this paper tends to show that to counteract the loss of oxygen which he sustains at high altitudes there is but one policy—namely, to provide him with an oxygen equipment which is at once as light and as efficient as possible—a consummation for which Haldane has striven unremittingly. And here I come to the personal note on which I should like to conclude. In the pages which I have read views have been expressed which differ from those which he holds in matters of detail—perhaps in matters of important detail. But Haldane's teaching transcends mere detail. He has always taught that the physiology of to-day is the medicine of to-morrow. The more gladly, therefore, do I take this opportunity of saying how much I owe, and how much I think medicine owes and will owe, to the inspiration of Haldane's teaching.

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ON THE

INVESTIGATION OF GASTRIC FUNCTION BY MEANS OF THE FRACTIONAL TEST-MEAL.[1]

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IN 1914 Rehfuss described a method of obtaining a continued record of the digestive functions of the stomach with the aid of a small-bore rubber tube, having attached to its lower extremity a perforated metal bulb, through which samples of a test-meal were withdrawn at intervals until the stomach was found to be empty. Analyses of the free hydrochloric and total acidity were made on the samples withdrawn and the results were plotted as a curve. The method has many obvious advantages over the old one-hour test-meal.

Together with his co-workers—Hawk, Fowler, Bergeim, and Clarke—Rehfuss published several accounts of the findings obtained both in healthy subjects and in sufferers from various gastric disturbances. Crohn and Reiss have also published observations mainly on hospital patients and having particular reference to the action of acid, antacid, and other drugs on the secretory cycle.

For some reason, however, the fractional method of gastric analysis does not appear to have been widely adopted in this country.

At the beginning of the present year the writer started to review the method both as a means of studying normal gastric physiology and as an aid to clinical diagnosis. Investigations on an extended scale are now in progress, but the results up to date have been so instructive that it seemed desirable to publish a brief account of the method and to forecast some of its possible applications, if only with a view to obtaining for it a wider recognition and trial. With the aid of a Rehfuss's or Einhorn's tube it has become possible to repeat on the healthy human subject a number of the historical animal experiments of Pavlov, and under circumstances far less troublesome and abnormal, while in clinical inquiries the information obtained may be so abundant that, in comparison, the worth of the one-hour test would appear to be greatly diminished. The writer has been able to confirm many of the findings of Rehfuss and to add a few additional observations to those already on record.

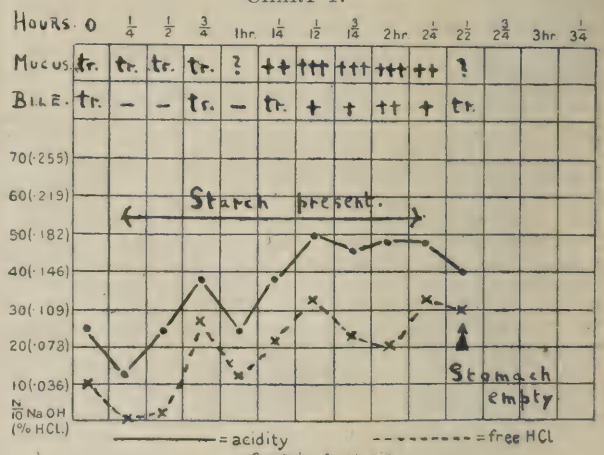
The present report consists of: (1) An abridged account of the technique. (2) Reproductions of specimen charts illustrating (*a*) physiological, (*b*) pathological phenomena. (3) A summary of the advantages of the fractional method of gastric analysis.

Technique.

The tube employed has been a rubber one, equal to a No. 6 or 8 soft catheter. Attached to the lower end is a small oval brass bulb containing numerous perforations. This is swallowed by the patient and the tube is rapidly "paid out." With explanation and kindly encouragement there should be no failures. Both in the descent of the tube and during withdrawal there is a tendency for the bulb to stick at the constriction corresponding with the cricoid. In withdrawal no force should be employed, but the patient should exert slight tension on the tube and swallow. As the wave of relaxation passes over it the bulb slips into the mouth. With the tube in place a specimen of resting juice is withdrawn and the total amount if necessary measured. A Record or all-glass syringe should be used for preference for withdrawing samples. A rack of 10 or 12 numbered test-tubes is at hand. The patient without withdrawing the tube drinks one pint of test-gruel prepared according to a fixed recipe,[2] and at intervals of quarter of an hour specimens of about 10 c.cm. in bulk are aspirated. After sedimentation in the tubes has occurred naked-eye observations are made of the food-content and the presence and amount of mucus and bile; the free and total acidity are determined quantitatively by the usual tests; and the time of disappearance of starch is noted by adding iodine to the residue in the tubes.

An average curve in a healthy subject presents the following features. From a resting free acidity varying

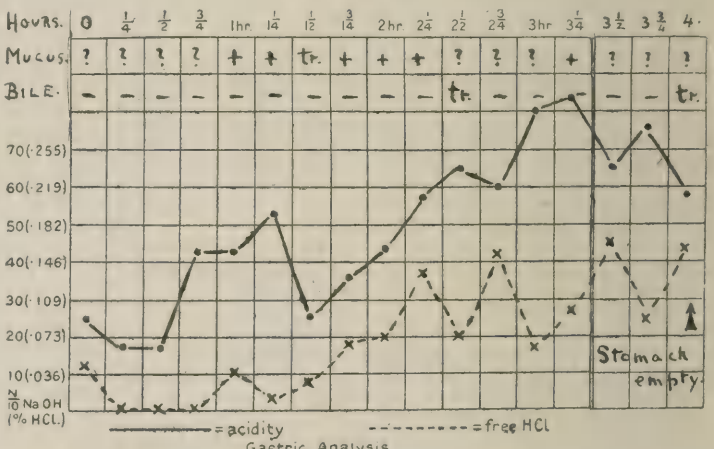
CHART 1.



Gruel test-meal (normal).

between 0 and 20 (N/10 NaOH), and following an initial fall due to dilution, there is a gradual rise up to 1½ or 2 hours, the maximum seldom exceeding 40 for the free or 60 for the total acidity. The curves run closely parallel. There is a slight drop from 2¼ to 2½ hours, at which time emptying is usually complete. The starch disappears in the last or penultimate specimen. There is a tendency for the mucus to increase as the food diminishes. Bile regurgitation may be present in the resting juice, and occurs at some period of the cycle—usually towards the end—in about 50 per cent. of

CHART 2.



Milk test-meal (normal).

healthy males. The criteria of approaching emptying are the withdrawal of frothy specimens of small bulk, the appearance of bile, and the disappearance of starch.

The figures for the acid are lower than those obtained with Ewald's test-meal, probably on account of the elimination of the psychic factor, the oatmeal gruel being somewhat unappetising and demanding no mastication.

Specimen Charts.

Chart 1 was obtained in the writer's case. It may be regarded as an average normal curve; it conforms with the type of curve obtained in upwards of 75 per cent. of healthy males.

Chart 2 shows the result of a milk test-meal of one pint obtained in the writer's case. Note the high-rising total acidity indicating the specific food response; the inverse ratio of free and total acidity after 2 hours possibly indicating acid-protein combination; and the slow rate of emptying—4 hours—probably due to the presence of fat, since skimmed milk in equal bulk emptied in 2¼ hours, while a meal of

[1] Based upon a communication made to the meeting of the Association of Physicians at Manchester.

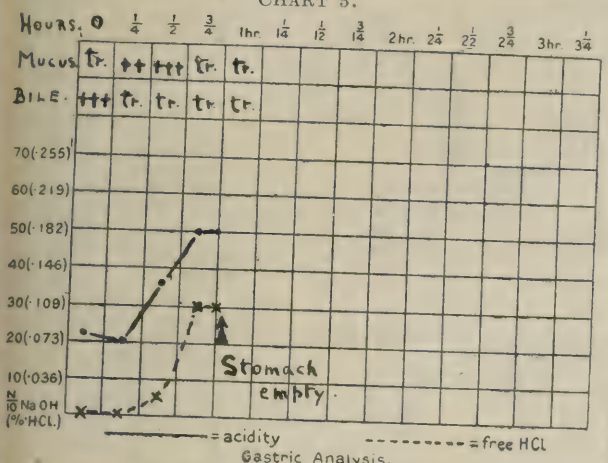
[2] Mix two tablespoonfuls of breakfast oatmeal with one quart of water. Boil slowly down to one pint. Strain through muslin. Add salt to taste and give warm.

cream and water of similar bulk took 4½ hours to empty, and after the initial rise, probably caused by the water, showed a very low output of HCl.

Chart 3 shows the result of drinking half a pint of water. Emptying was not complete for 55 minutes, but took place rapidly after the free acid reached 30. Emptying appeared to become active at this degree of acidity in all the writer's tests, the attainment of this point, at whatever phase of the curve it occurs, coinciding with the most active subjective peristaltic sensations and sometimes with audible borborygmi.

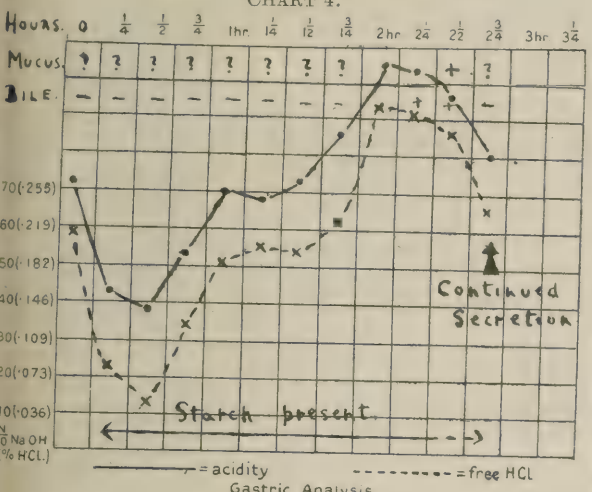
In experiments extending over a period of a month no effect on resting or active juice as the result of deficient or excessive salt intake could be demonstrated. The resting juice was found to vary in its free acidity from 0 to 20 and showed wide variations in the actual amount obtainable.

CHART 3.



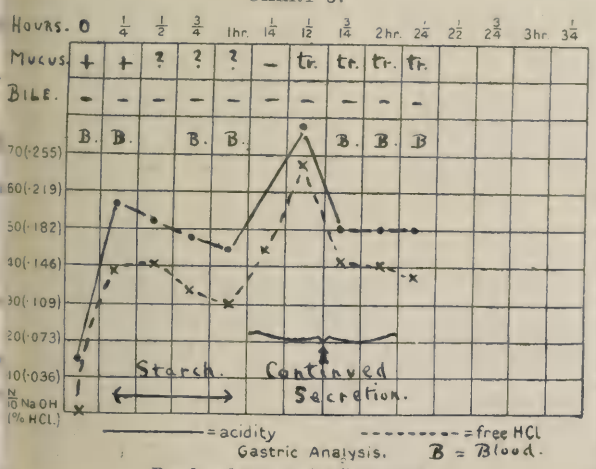
Water test-meal (half-pint) normal.

CHART 4.



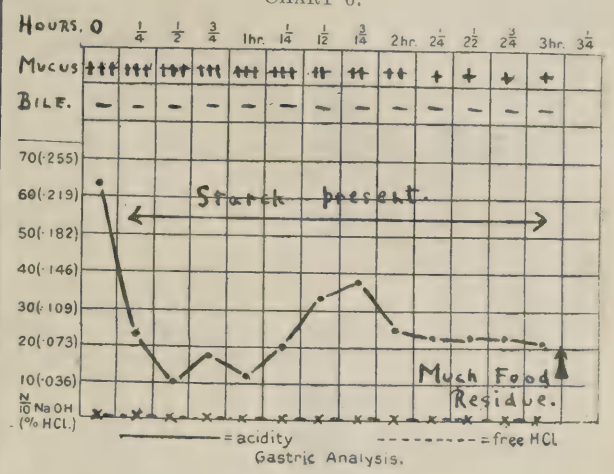
Duodenal ulcer (without "hurry").

CHART 5.



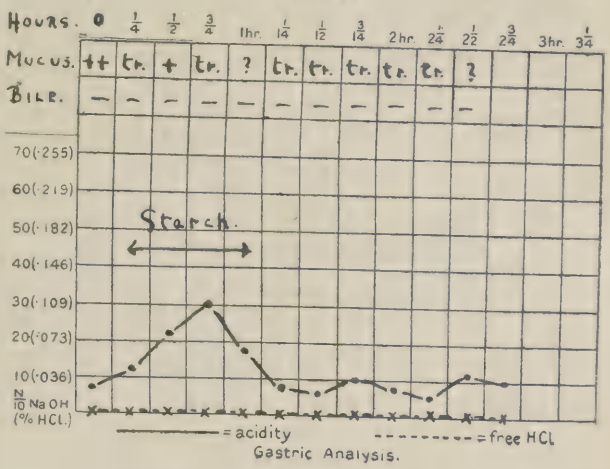
Duodenal ulcer (with "hurry").

CHART 6.



Pyloric neoplasm.

CHART 7.



Acne rosacea showing achlorhydria.

In the pathological series:—

Chart 4 is from a case with history and symptoms strongly suggestive of duodenal ulcer. Note the high acidity of the resting juice, which is very copious, the steep-climbing curve, and the continued secretion. Curves of this character have been very constantly obtained in "duodenal" cases.

Chart 5 is from a case of duodenal ulcer confirmed at operation. In this case a clinical and X ray diagnosis of chronic gall-bladder and appendix was made. The additional diagnosis of ulcer was made on the test-meal result. Note that at one hour the acidity is within normal limits, whereas half an hour later there is definite hyperchlorhydria. Note also the extremely rapid emptying—"duodenal hurry"—the presence of blood in 8 out of 10 specimens, and the continued secretion.

Chart 6 is from a man, aged 51, whose clinical features strongly suggested growth; vomiting was absent, but the test showed very definite pyloric delay. In addition there is achlorhydria and a big disparity between free and total acidity.

Chart 7 is from a case of acne rosacea. In this condition, the association of which with indigestion is well recognised, achlorhydria or marked hypochlorhydria has been very constantly demonstrated.

Summary.

The advantages of the fractional method of gastric analysis may be summarised as follows:—

(1) Its technique is extremely simple. Both for patient and operator the manipulations involved are easier and less unpleasant than is the case with the large stomach-tube.

(2) It is probably the best method yet described for investigating and also for demonstrating to students the secretory functions both of the healthy and the unhealthy human stomach. For—

(3) It allows of a graphic presentation of the whole digestive cycle with reference to the free and total acidity, the secretion of pepsin, the secretion of mucus, the regurgitation of bile, and the rate of disappearance of starch and sugar from the examined contents.

(4) It allows of an estimate of the rate of emptying at least as accurate as that obtained by means of radiography and the barium meal.

(5) It allows of qualitative and quantitative investigations of the resting juice and of the post-prandial secretion (when present), and of its cytology and bacteriology, as well as its chemical features.

(6) It avoids the fallacy of a one-hour reading with subsequent or previous abnormal variations.

(7) It makes possible the investigation of certain symptoms, such as "heartburn" and of pain, having special time relationships.

(8) It permits of the study of the local action of drugs taken into the stomach and of reflex secretory effects.

(9) By means of parallel X ray examinations a correlation of chemical and mechanical functions becomes possible.

(10) Owing to the whitish colour of the gruel employed and the number of specimens withdrawn small quantities of macroscopic blood are much less likely to escape detection than with the older methods.

If necessary investigations can be pursued beyond the pylorus, as, with X ray coöperation, the bulb can easily be passed into the duodenum.

No attempt has been made in this communication to base conclusions on the results thus far obtained, for the inquiry, so far as the writer and his colleagues are concerned, is still in its early stages.

Thanks are due to Dr. A. F. Hurst, who has largely stimulated the investigation and provided numerous cases of interest; to Dr. M. S. Pembrey and Dr. J. H. Ryffel, in whose laboratories at Guy's Hospital the work has been done; to Dr. T. I. Bennett, who is at work on normals and also upon pharmacological effects; and to Mr. M. Maizels and numerous students who have volunteered to act as subjects in order to help in the establishment of the normal variations.

For the illustrations (Figs. A and B) of the tubes employed the writer is indebted to Messrs. Down Brothers. Fig. B is a modification designed to facilitate swallowing and to avoid the possibility of slight trauma to the gastric mucosa when strong suction is exerted through the metal bulb on an almost empty stomach.

FIG. A.

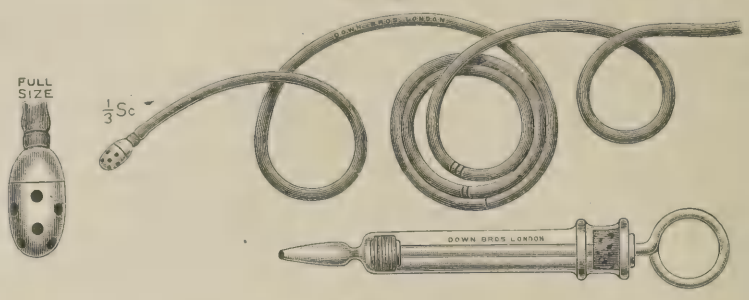
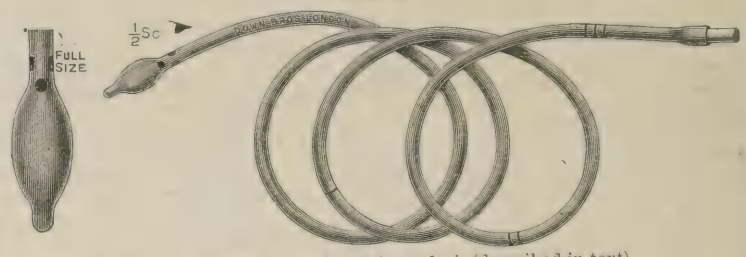


FIG. B.



Tubes used in fractional gastric analysis (described in text).

References.—Rehfuss and Hawk: Journal of American Med. Assn., vol. lxiii., No. 1, p. 11. Rehfuss, Bergeim and Hawk: Ibid., No. 11, p. 909. Rehfuss and Hawk: Ibid., No. 24, p. 2088. Fowler, Rehfuss and Hawk: Ibid., vol. lxv., No. 12, p. 1021. Rehfuss: Ibid., vol. lxiv., No. 7, p. 569. Rehfuss, Fowler and Clarke: Ibid., vol. lxiv., No 21, p. 1737. Rehfuss: American Journal of Medical Sciences, 1914, p. 848. Crohn and Reiss: Ibid., 1917, p. 857; 1918, p. 801; and 1918, p. 656.

ANTISYPHILITIC PROPHYLAXIS:

AN INVESTIGATION INTO ITS USE, NON-USE, AND MIS-USE.

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IN order to arrive at some figures with regard to the use of venereal disease prophylaxis by men and at some true information as to what, if any, precautions are being taken amongst the class of people who present themselves at one of the ordinary public centres for the free treatment for venereal disease, I have recently collected information from 608 cases who presented themselves at the syphilis clinic at the London Hospital under my chief, Dr. J. H. Sequeira.

Scope of Inquiry.

This report has reference solely to syphilitic infection and to no other venereal disease.

For the most part the men concerned were of the ordinary hospital out-patient class, but there were some more intelligent people amongst them, such as military officers or clerks. The plan adopted was the private questioning of each individual patient, and I have every reason to believe they answered questions truthfully. As far as possible the cases were taken consecutively as they came on certain special days for syphilis. Careful attention was directed towards accuracy of time of events; what precautions were used, and how used, and whether before, after, or during connexion; how much of the prophylactic agent was used, and whether the patient had had any intoxicating liquor at the time or not.

Many interesting and useful points were elucidated during the questioning.

Many contracted the disease while in France from "licensed houses," and because the houses were "licensed" they all, without exception, believed the women were "clean," and therefore took no precautions at all. This fully endorses what Lieutenant-Colonel E. T. Burke, R.A.M.C., says in his article[1] on "Venereal Disease in War":—

"The licensing of brothels and the medical examination of the inmates possess not the slightest value. This has been fully proved wherever it has been tried. In spite of medical examination it is quite impossible to guarantee that any public woman is free from infection. Regulation gives a false sense of security and makes the authorities directly responsible for any infection that may result."

Some believed that a solution of potassium permanganate, or Condy's, applied by a few moments' douching, and of no matter what strength and how long after the connexion, was sufficient protection. Others believed that the washing of their parts with their own urine, even hours after, was also sufficient protection against venereal disease. Ordinary washing with soap and water soon after connexion was very rarely done. Lysol and other similar drugs were used by a few, even to a strength which resulted in burns. Of those infected after using a rubber sheath, each definitely stated that the sheath broke during connexion. (See below.) The high percentage of those infected during partial or total intoxication by liquor will be referred to later.

Of the 608 cases only 12 had used, in various ways, prophylactic outfits—"packets"—with calomel ointment (33 per cent.). These I have labelled "special" cases in the table of results of inquiry, and will give their details later.

Table of Results of Inquiry.

(1) Took no intoxicating liquor and used no prophylaxis at all	287
(2) Intoxicated	102
(3) Partially intoxicated and used no prophylaxis at all	67
(4) Partially intoxicated and used pot. permang. within 10 minutes of connexion	5
(5) Partially intoxicated, but bathed with own urine within 10 minutes of connexion	8
(6) Used pot. permang. within 10 minutes of connexion	24
(7) Used pot. permang. from 10 minutes to 12 hours after connexion...	51
(8) Used soap and water within 10 minutes of connexion	10
(9) Used tap water only within 10 minutes of connexion	14
(10) Bathed penis with own urine within 10 minutes of connexion...	16
(11) Used rubber sheath which broke during connexion	5
(12) Used lysol or similar drug within 10 minutes of connexion..	7
(13) "Special" cases (calomel—see below)	12
Total	608

From this table it will be seen that the following information can be extracted:—

Total number of those using no prophylaxis (1, 2, 3) ...	456, or 75%
Total number of those under influence of liquor (3, 4, 5)...	182, or 29·9%
Total number using pot. permang. (4, 6, 7)	80, or 13·2%
Total number bathing in own urine (5, 10)	24, or 3·9%

Details of "Special" Cases.

CASE A.—Four hours after connexion, rubbed half tube of calomel from a packet on to the glans only. Did not rub any into the corona or on the body of penis. Chancre developed on the body ½ inch behind the frenum, where he did not rub any calomel.

CASE B.—Quarter of an hour before connexion injected half tube of nargol into urethra and placed half tube of calomel around corona. Twelve hours after connexion used other half of each tube as before. Chancre developed ½ inch behind frenum on body of penis where he did not rub any calomel.

CASE C.—Had connexion three or four times with the same woman on three or four consecutive days and only used calomel after the last connexion of all. Immediately after the last connexion he washed his penis in water and rubbed on and injected calomel from a military prophylactic outfit, using one whole tube. Chancre developed on glans one month after. Had had other previous recent connexions when he did not use any prophylaxis at all.

CASE D.—Rubbed on quarter tube of calomel immediately before and after connexion, to glans, corona, and body only. Had "wash-out" at military prophylactic tent 10 minutes after. No sign of chancre on penis or scrotum, but his throat was very suspicious. He had post-cervical and epitrochlear adenitis, a macular rash, and condylomata at the anus.

CASE E.—Immediately before connexion used a navy packet. He injected about quarter tube into urethra and placed about quarter tube on glans. After connexion he did the same, using about the same amounts and also washed in Condy's one hour afterwards. He stated that there were no instructions how to use the tube in the packet. The chancre developed on the body side of the corona where he did not rub any calomel.

CASE F.—Half hour after connexion went to a military prophylactic tent where he washed the parts and syringed out his urethra with pot. permanganate and rubbed calomel ointment all over his penis, but using only half a tube. Three days later two sores developed, one on the prepuce and one on the frenum. He had had previous recent connexions when he did not use any prophylaxis at all.

CASE G.—Used nothing before or after the connexion. Three weeks later a sore developed on the glans which he reported to his medical officer, who instructed him to use calomel ointment. He used one whole tube.

CASE H.—Before and after connexion he rubbed on calomel to penis only, from a Canadian Red Cross packet. No chancre developed on his penis, the primary lesion being in his throat.

CASE I.—Two hours after connexion he rubbed on and injected calomel from a military outfit. Owing to not being able to get his prepuce back he was unable to get any ointment there and that is where the chancre developed.

CASE J.—Thirty-six hours after connexion he injected quarter tube of nargol into urethra and placed on quarter tube of calomel around the corona, from a "Dreadnought" outfit. Two weeks later he developed two sores in the corona. He had had previous recent connexion, when he used no prophylaxis at all.

CASE K.—Quarter of an hour after connexion he injected half tube of nargol into urethra and rubbed on half tube of calomel on to penis and scrotum, from a "Dreadnought" outfit. Chancre developed on left inner side of thigh where he did not rub on any calomel ointment.

CASE L.—One hour after connexion he injected quarter tube of calomel into his urethra, and rubbed three-quarters tube on to glans and corona from a military outfit. Chancre developed on middle of body of penis four weeks later, where he had not rubbed on any calomel ointment. Ten days previous to this connexion he had had another, when he did not use any prophylaxis at all.

Discussion of Results of Inquiry.

That 30 per cent. of the cases were under the influence of drink at the time tells its own story. Alcohol not only lowers the resistance, but it is asserted that connexion takes longer when under its influence. Hence there is a longer time for the parts to be in contact, and so the parties are more liable to infection. Also in the rare cases in which prophylactic measures were intended they would probably be omitted if the man were partially intoxicated, and certainly if he were totally intoxicated.

It must be well noted that there was not a single case of infection after using a rubber sheath, except when the sheath had broken actually during connexion. This fact led me to make inquiries from chemists and other shops where sheaths are sold, and from them I learned that an average of 10 gross per week were sold at each. One shop claimed to sell as many as 50 gross per week. These shops were in the central part of London. Granted that many were sold to married people and others to prevent conception, yet this also surely means that one of the best prophylactics we have is the rubber sheath. This means of prophylaxis is also advocated by Professor Gougerot,[2] who, under the heading of "Venereal Disease Can be Avoided," in his recent report to the Interallied Congress of Social Hygiene, says:—

"..... Before the act ..... grease the parts with calomel ointment or with some such ointment. Put on a substantial rubber sheath which has not already been used ....."

and in another place:—

"A good sheath, not having been used, is, in every way, the surest means of escaping contagion."

As regards prophylactic outfits—"packets"—only 12 of the 608 cases had used this system and all had in different ways applied the calomel ointment wrongly. Either they had used it only after connexion, or had not rubbed it in over all the parts recommended, or had used it much too late. It is important to note that of the 12, 3 developed extra-genital chancres; 1 used calomel after the chancre had developed; 1 applied calomel only after the last of a series of connexions lasting over several days; 3 had had previous recent connexions when they did not use any prophylaxis at all; 4 developed chancres at sites different from the site where they applied the calomel ointment, and one of these had also had a previous recent connexion, when he had not used any prophylaxis.

Here, again, the evidence points in favour of the efficiency of calomel ointment as a prophylactic against syphilis. From chemists I also asked for information about this ointment, and they stated that though they could not by law offer for sale or advertise the germicidal properties of the ointment, yet they sold quite a quantity to those who asked for it or had it ordered by a medical prescription. Professor Gougerot,[2] also in the same report, says:—

"..... Smear calomel ointment or in its place some similar ointment and use a sheath ....."

He also advocates the rubbing in of calomel ointment immediately after connexion.

Data Taken from Recent Military Experience.

The Canadian military authorities[3] actually issued 571,180 tubes to an average strength of 277,500 troops in Great Britain from April, 1917, to August, 1919, and their Y.M C.A. branch in Paris, from November, 1917, to March, 1918, gave out 50,000 preventive tubes to 22,000 men of the Imperial Force who were on leave to Paris between those dates. This means that the number of tubes issued was about double the number of men.

In Paris from June to November, 1918 (five months), with abundant disinfectants given individually to the Anzacs[6] on leave, the number of infections was only 20, whereas in the five weeks, November–December, when the supply of disinfectants was temporarily cut off, the number of infections was 24. In October, 1918, there were approximately 5000 troops on leave, a large proportion being Anzacs, among whom in that month there were only 3 infections, whereas among the English, who were not nearly so well supplied with disinfectants, there were in that month 42 infections. Also in August to September, 1917, when there

was no issue of disinfectants, over 5000 troops came on leave to Paris and over 1000 of them became infected, whereas in November, 1917, to March, 1918, when over 30,000 came on leave and there was an issue of disinfectants, only 3 per cent. became infected.

From this I would deduce that the prophylactic system was not a failure, but the results show that, if properly carried out, this system was reasonably effective in preventing venereal disease.

More recently still have been published the results of the prophylactic system in use at certain military units at Portsmouth,[7] where the rate of infection of venereal disease fell to 1·5 per 1000 per annum, and now the town council of Portsmouth is seeking to popularise methods of prevention among the civil population of the borough. At Liverpool military camp in New South Wales[8] the rate of infection was also greatly diminished by such a system.

Most people, I think, agree that calomel ointment is an almost sure agent if applied correctly, and I want to lay great emphasis on the fact that all "packets" should have proper instructions for use enclosed, especially insisting on the use of both a sheath and calomel ointment at the same time, for, as Lieutenant-Colonel G. Raffan, A.A.M.C.,[5] points out:—

"Rubber sheaths alone are not safe, they vary in quality and are sometimes very fragile ..... a (calomel) lubricant in addition is desirable."

Had the 5 cases quoted in my table above used calomel ointment as well as the sheath, and had 6 of the 12 "special" cases applied the calomel correctly, most probably they would not have become infected.

Pitfalls and their Avoidance.

It is also necessary to emphasise very strongly, in the instructions, that the influence of alcohol at the time notably increases the risk of infection. The calomel ointment should be rubbed in well, not merely placed on all parts. It is said that calomel is apparently converted into perchloride[4] within the tissues—hence the need of rubbing it in.

To guard against attempts at self-treatment by infected people with outfits it should be clearly stated in the instructions that the outfits will only prevent and not cure.

These, I think, are the chief points bearing on the figures I have obtained. The above and other instructions as regards other drugs and their method of use have been published many times, but from my figures as regards syphilis it cannot be too well drilled in that alcohol is to be avoided at the time, that calomel ointment must be rubbed in, and that at the same time suitable precautions must be taken against other venereal disease.

Lastly, the importance of early treatment centres cannot be overlooked, especially as such a great percentage become infected when under the influence of liquor and therefore use no prophylaxis at all. Early treatment centres should then be available the moment the man regains his senses.

Lieutenant-Colonel Burke[1] has recently published some extraordinarily good results, and I cannot do better than quote them here:—

Number applying for prophylaxis	894
Number of above who developed symptoms	Nil.
Number of venereal cases admitted	78
Number of these who had had prophylactic treatment...	2

Which clearly shows what can be done when prophylaxis is properly carried out.

After all, prophylaxis is only common-sense hygiene; and as Dr. Sequeira very aptly puts it: "It is for the same reason a surgeon washes and disinfects his hands before and after and wears rubber gloves during an operation."

I am greatly indebted to Dr. Sequeira for having allowed me to make these observations.

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THE PRINCIPLES UNDERLYING THE STANDARDISATION OF AGGLUTINABLE CULTURES.

With a Note on

THE APPLICATION OF DREYER'S SYSTEM TO B. PARATYPHOSUS A.

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IN attempting to form a true estimate of the value of Dreyer's system of standardisation it is important to give separate consideration to its two aspects: (1) The general principles upon which it is based; (2) the particular applications of the principles to serological practice that have been made or proposed. A number of private discussions concerning the use of standardised cultures have made it clear that a statement of general principles is needed if tiresome misunderstandings are to be avoided.

The present article is an attempt to state these principles and their working in general terms without reference to the various published criticisms of Dreyer's method, for these have dealt almost entirely with standardisation in clinical practice. The reader is, however, recommended to peruse Part I. of the Medical Research Committee's Special Report Series, No. 48 (1920), in which certain observations of Drs. W. W. C. Topley, A. C. Imrie, and S. G. Platts seem to conflict with some of the principles here stated.

The Measurement of Agglutinating Power.

The possibility of making some kind of measurement of the agglutinating power of a serum has long been recognised, and the expression of such measurements in figures representing the highest dilution in which complete (or partial) agglutination occurs has become an established practice in bacteriological laboratories all over the civilised world.

The great majority of workers in this sphere have employed living or killed agar cultures of the bacilli for their agglutination tests, and it has been tacitly assumed that 24 hours agar cultures suspended in salt solution form a material so constant in agglutinability that they can be satisfactorily employed as a standard for the measurement of the power of a serum.

I use the word "standard" advisedly, and for this reason: It is axiomatic that no measurement or series of measurements can be made without a standard. Every measurement is a comparison of X with Y, wherein Y is the standard whereby X is measured. If Y be a permanent and constant quantity it can be used as standard for an indefinite series of measurements; but if it be perishable or an unreproducible quantity it can only be used for the single operation. Measurements of length are only possible if we choose an object of a particular length as our standard and compare with it the articles which we desire to measure. Every man can have his own standard of length, if he will, and make his measurements with it to the highest possible pitch of accuracy. But in such a case John Smith, who has chosen the span of his right hand as his unit, will suffer no little inconvenience when purchasing articles from Dick Robinson, whose custom it is to measure with the cubit. A laborious process of translation will have to be gone through at each transaction. Language is another simple case of standardisation. A word is but the standard sound agreed on by a group of persons for the expression of an idea; and it would clearly be an enormous convenience and saving of time and labour if the whole civilised world could agree to a single set of standards, though this might possibly bring with it, in our present state of civilisation, disadvantages in the realms of history and sentiment heavy enough to outweigh the practical gain.

But to return to our subject, we must be clear as to what has hitherto been the actual standard in agglutination tests. Our custom has been to measure the highest dilution of serum that can bring about a definite change in a suspension of bacteria. Since we are dealing with only two materials, serum and culture, and since the former is being measured, it is clear that the culture is the substance *by means of* which we are measuring it.

The actual comparison is, of course, not between serum and culture, but between one serum and another serum measured either with the same culture or with another which has been assumed to be of identical agglutinability. The culture is thus our standard, though a standard of a nature slightly different from that of simple standards of length, weight, and so forth.

Just as we have seen that any man may make perfect measurements of length by means of any unit that takes his fancy, so any man can make accurate comparisons of the power of two or more sera by means of any specific bacterial suspension he may chance to make, though his tests must be done all at once and can never be repeated if the bacteria are alive and unfixed, for his standard is perishable. If he has killed and partly fixed his bacteria, in bulk, he has a much better but still imperfect and undurable standard available until it is all used up.

Now the whole of the system of agglutinin measurements in the past has been based on the assumption that all 24-hour cultures of a given bacillus possess a sufficiently constant degree of agglutinability. If this were so they would constitute a satisfactory standard material; but it is not so. Not only do they vary, but they vary profoundly. A strain of the typhoid bacillus may yield one day a culture which reacts with a ten thousandfold dilution of a specific serum, and another day may show no response to the same serum at 1 in 100. This is an extreme case, but variations of smaller though still very considerable amplitude are the rule; so that two successive subcultures of a typical and highly agglutinable strain of, e.g., *B. typhosus*, may differ by 100 or 200 per cent. in their end-titres with a serum.

It may be that future discoveries will enable us to control the exact composition of culture media and all the conditions of bacterial growth in such a way as to ensure the production with certainty of uniform living cultures of constant agglutinability. But this is at present impossible and is quite likely to remain so. The position, then, until recently may be described thus:—

In measuring the agglutinating power of sera bacteriologists have used a method in which the standard is the agglutinability of 24 hours' cultures of strains of the organism in question. Since the results of all measurements of whatever nature can only be expressed as multiples of some unit, a unitary system has had to be adopted here also. It is, however, "camouflaged," so that it appears superficially not to be a unitary system at all.

Let us analyse the expression "titre = 1/1000."

It means that the highest dilution of serum which gave the reaction was 1 part in each 1000 parts of the test mixture (serum and suspension). In other words, the least *quantity* of serum that reacted was one unit by measurement in every 1000 units by measurement of the mixture. This quantity is really the unit of agglutinating power[1] in this system of measurement. If we measure in cubic centimetres our result can be stated thus. By mixing 1 c.cm. of the serum with 499 c.cm. of diluent we obtain a mixture of such agglutinating power that 0·5 c.cm. of it will just react with 0·5 c.cm. of the suspension. This 1 c.cm. of final dilution may therefore be said to be 1 unit strong. The full-strength serum is, then, clearly 1000 units strong. But it is, in truth, only for the particular suspension in use that this statement holds good. With other suspensions the end-dilution and therefore the estimated strength of the serum would not be the same. Perhaps it is for this reason that the expression in dilution has been retained and an expression in units rejected. But a moment's thought will make it clear that, so long as our suspensions are unstandardised, our records of the strength of a serum are equally unreal, whether we use dilutions or units. There is no fundamental difference whatever between the two methods of expression, for the figures given by the one are merely the reciprocals of those given by the other. None the less, the first method has certain disadvantages from which the second is free.

(1) Expression in dilutions conceals the inner meaning of the system of measurement. If the words "standard" and "unit" had originally been employed it would always have been clear to all that the standard and unit in use were greatly in need of improvement.

(2) It is more bother to record fractions than simple figures. The mild irksomeness of writing fractions has, in fact, driven most serologists to record only the denominator of their dilution figures—e.g., to write "titre 1000" for titre 1/1000. Thus it is interesting to see that people have slipped into the way of recording their results actually, though not explicitly, in units (though not "standard" units).

For the reasons just given it is tolerably clear that an explicit recording in units is always preferable whatever system of measurement be adopted. A measurement which cannot be expressed in units is simply not a measurement and should be relegated to the sphere of mere qualitative observations. Every worker who expresses a result as a titre, without reserve or qualifications, assumes the existence of a standard and a unit. Otherwise, the figure he gives is absolutely void of meaning.

Methods Hitherto Employed.

We have come in our argument to this point.

(1) The common method of estimating "titre" of agglutinating sera makes use, as all methods of measuring must do, of a "standard" and of a unit. The standard is the 24-hours' living suspension of the specific organism, assumed erroneously to be of sufficiently constant agglutinability. The expression of "titre" in dilutions is simply an expression of the reciprocal of the strength of a serum in units measured by this standard.

Most workers have realised that there should be standard conditions of time, temperature, &c., for their reactions, and they at least do not omit to mention what conditions they apply to their tests. Some, however, while expressing their results in reciprocal units (i.e., dilutions), fail to realise that by omitting all mention of these fundamental experimental conditions they destroy whatever reality their measurement may have had for other workers. It is as though one man should ask of another, "How wide is the river?" and he should answer, "Fifty."

(2) The standard adopted in this method is a bad one.

Undoubtedly it has been better than none at all, for it has enabled a certain stage of knowledge to be reached. It is a bad standard because a highly variable one. Usually approximately true within certain wide limits, its fluctuations could on occasion be calamitous. Even if a single uniform technique had been in vogue the system was only capable of giving an answer comparable in precision with the schoolboy's answer: "It's as big as a lump of cheese."

The first, so far as I am aware, to realise the inherent weakness of the standard was Madsen, who devised a method whereby fluctuations of agglutinability in suspensions were discounted.

When measuring the power of an unknown serum he always compared it with a known serum, using the same suspension in testing the two. The strength of the unknown serum could then be expressed in terms of the known "standard" serum. By this method differences in the strength of two unknown sera could be determined with a fairly high degree of certainty.

It suffered, however, from the important weakness that all serums are unstable, and that therefore his standard was a constantly shifting one. This defect was remedied by Dreyer,[2] who worked out the technical process whereby bacteria can be made into suspensions of such stability as to be available as a trustworthy standard material on which to measure the agglutinating power of sera.[3]

Essentials of Dreyer's Process.

The main essentials of the process may briefly be stated as: (1) growth of the organism in simple fluid media such as broth; (2) sterilisation with formalin in the cold, by the addition of just enough formalin to kill and fix the bacilli (0·1 per cent.) and no more. These steps succeed in procuring a suspension of the following characters.

(*a*) The bacteria are dead and fixed, like museum specimens, and therefore do not autolyse. Autolysis in the early stages of the fixation process, which takes a few days, is largely inhibited by the low temperature.

(*b*) The organisms remain in the surroundings in which they grew up. This avoids damage such as is done in the violent exposure of agar cultures to the disintegrative influence of pure salt solutions.

(*c*) The suspensions contain no excess of antiseptic which might undergo change into acids or other bodies detrimental to the suspensions.

[1] Dreyer's expression "agglutinin unit" is objected to by some as a false expression which assumes the existence and measurability of a definite substance called agglutinin. But no such assumption is made by Dreyer, who employs the expression as a convenient abbreviation of "unit of agglutinating power." Perhaps it would be better to use the latter expression and avoid the word agglutinin, though it is a considerable convenience.

[2] Dreyer, G.: Hospitalstidende, No. 19, 1906; and Journ. of Path. and Bact., xiii., 331, 1909.

[3] The scope and purpose of this article makes it unnecessary to mention the immensely important work of other pioneers in agglutination technique.

(*d*) There is either no loss of agglutinability at all (e.g., the typhoid group) or a transitory loss of no importance (*B. dysenteriæ*).

(*e*) The characters of an emulsion are preserved for years without change.

(*f*) Successive suspensions of any strain can be tested against each other, and each can be given an "agglutinability-constant" which expresses its precise degree of agglutinability relative to one of the suspensions arbitrarily chosen as standard. This process, then, provides us with a method whereby true measurements of the power of any serum may be obtained; for we have a stable and trustworthy standard of reference, which confers on our measurements a reality which was unattainable by means of the bad standard hitherto in use.

Its Scope and Limitations.

Before discussing the scope and limitations of Dreyer's standard unitary method and in order to clear the ground it must be clearly stated that the principle of the method is of theoretically universal applicability wherever quantitative agglutination tests are to be made, whether they form a part of experimental or of routine clinical work. Let us first of all consider its application to a kind of research that is much practised at the present time.

Suppose we have obtained from a clinically similar group of sick persons a number of strains of bacilli whose main cultural characters are those of some already known organism. We propose to identify fully and classify the bacilli by means of cross-agglutination tests. So we make a number of agglutinating sera with stock strains of the known organism and with each of the bacilli we isolated. The question arises, How shall we make the suspensions to be used in the tests? The decision depends upon whether or no we take into account the fact that no two sub-cultures of a strain can be assumed to have the same degree of agglutinability.

It will be of interest to compare the results of neglect of the variability-factor with the effects of its recognition in an imaginary research. Suppose we are testing one of our new recently isolated strains against the known bacillus, cross-agglutinating both with sera made from each. We make to-day a living saline suspension of each bacillus. We standardise the bacterial content by some adequate method, in order to eliminate the effect of variations in the mass of bacilli acted on. We test them both with the serum of the known bacillus ("known serum") and find that the highest dilution in which known bacillus is agglutinated is 1/1000. The reading for the unknown bacillus with the same serum is 1/500.

The next step, which we carry out the next day, is to test the two strains with the serum made with the unknown bacillus (unknown serum). So we make two fresh living suspensions as before, put up the test, and obtain the following readings.

Unknown serum { Known bacillus 1/1000.
Unknown bacillus 1/2000.

What conclusions can we draw from these two tests? We can undoubtedly conclude that the two organisms belong to the same group, but what about their serological identity? We can draw no conclusion whatever.[4] And the reason is that in the former experiment we may, for all we know, have been dealing with a "known bacillus" suspension of supernormal agglutinability and in the latter with a normal or subnormal suspension. "Unknown bacillus" may have given yesterday a roughly normal suspension, to-day one of high agglutinability. If this has been the case, our results are compatible with a complete serological identity of the two strains.

But it may equally well not have been the case. We can with equal reason suppose that yesterday's "known" suspension was of low sensitiveness and the "unknown" suspension supernormally sensitive, while to-day we have happened to meet with reversed conditions. In this case it is clear that the two experiments have made the strains appear much more similar than they really are.

These experiments, therefore, leave us absolutely in the dark as to the true relationship of the two strains, and all because we have failed to eliminate the variability-factor of suspensions.

It may be objected that in the instance given variations in agglutinability of 100 per cent. are represented, and that such variations do not occur, or at least are rare. But they undoubtedly do occur, and by no means uncommonly. And in any case if it be granted that they occur at all, it follows that every test of the nature described is necessarily an object of suspicion. Again, it may be objected that any sensible person would test the two sera of our illustrative experiment on the same day, using only the one suspension of each strain for the purpose. Yes, but he may have scores of strains to test with dozens of sera, and he cannot possibly test them all on the same day. He will therefore have to make more than one suspension of some strains, since unformalised suspensions do not "keep."

I have attempted to make it clear that variations in sensitiveness of successive cultures of an organism have vitiated the quantitativeness of our agglutination tests, and have had the effect at the best of hiding otherwise ascertainable facts, or, if we are unaware of the weakness of our method, at the worst of leading us to definitely erroneous judgments.

Advantages of Dreyer's Method.

Now let us, in imagination, repeat the same experiment with Dreyer's method.

Dead formalised cultures of the two strains are made and diluted to the requisite density. It would be best, of course, to make enough of each to last through the whole series of experiments; but let us suppose for the sake of demonstration that we are compelled by circumstances to prepare new suspensions for each experiment. For the first day's test, then, we have suspension (1) of unknown bacillus, and suspension (1) of unknown strain.

With the known-strain serum we find that first known suspension gives its end-point at 1/1000, and first unknown suspension at 1/500. These two suspensions are our standards for the two strains, and the remainder of each is stored until our next experiment. Some days (weeks or months) later we test the unknown-strain serum on two new suspensions.

As a preliminary we test the second "known" suspension against the first known suspension (with the homologous serum) and find that it possesses only half the agglutinability of suspension No. 1—i.e., that it takes the double quantity of serum to agglutinate it to the end-point. By the same process unknown suspension No. 2 is standardised against unknown No. 1, and its agglutinability is found to be double that of No. 1. We can express the findings thus, placing the sensitiveness of the standard suspension in each case as unity.

Suspension.	Agglutinability-factor.	Suspension.	Agglutinability-factor.
Known No. 1	1·0	Unknown No. 1	1·0
Known No. 2	2·0	Unknown No. 2	0·5

We now carry out the test of the two No. 2 suspensions with the unknown serum, and we obtain these readings:—

Known susp. No. 2, 1/1000. Unknown susp. No. 2, 1/2000.

Before forming any opinion as to the meaning of the results we translate the figures into standard units thus:—

Reciprocal of dilution. Known serum.	Agglutinability constant.	Standard units.	Reciprocal of dilution. Unknown serum.	Agglutinability constant.	Standard units.
Known culture. (1), 1000.	1·0	1000	Known culture. (2), 1000.	2·0	500
Unknown culture. (1), 500.	1·0	500	Unknown culture. (2), 2000.	0·5	4000

From these figures we conclude that each serum agglutinates its own strain more highly than the other strain, and therefore that our experiments have yielded prima facie evidence that the strains are serologically distinguishable. This information could not have been obtained with unstandardised suspensions, as we have seen.

The Value of Standardisation.

I need not elaborate the argument by showing what our conclusions would be if we found agglutinability factors other than those postulated. For whatever they may have been, our experiments would have yielded a definite piece of information which we could not have obtained with unstandardised suspensions. The reader will have noted that the argument is based on the belief that any two subcultures of an organism give a constant ratio of agglutinability when tested with any number of sera. This belief is not a mere assumption, but rests on much routine experience and on direct (unpublished) experiment. The only published observations that weigh in any way against its truth are in the Medical Research Committee's Report mentioned above. It may be well to take another instance of the value of standardisation in agglutination experiments.

[4] It has been suggested to me that my illustrative examples are unconvincing, because nobody pays any attention in practice to variations of less than several hundred's per cent. If this be true, it constitutes an admission of the scientific weakness of current methods.

An experimenter wishes to study the variability of individual strains of bacteria as regards morphological, biochemical, and serological properties, and to attempt a correlation, if possible, of the various changes. Of this research it only concerns us to deal with his agglutination tests and to show how, by standardisation of his materials, he can ascertain facts which he could discover by no other means. His method, we will suppose, is to grow a strain of bacilli on some special medium for six months and to test its behaviour at intervals. If he is unfamiliar with, or distrustful of, the principle of standardisation he will naturally carry out his tests with fresh cultures of the organism. He makes an agglutinating serum in sufficient quantity to last over the whole experiment, and with it he tests the suspensions made, let us say, one every week.

Plotting a curve from these observations he finds it to be very spikey and wobbly ("experimental error" he calls this) and to show a slight but constant decline.

What conclusion can we scientifically draw from such a curve? He can only say: either the culture has remained unchanged in sensitiveness, while the serum has degenerated slightly; or the agglutinability of the culture has increased somewhat, but the serum has lost enough to overbalance that change; or, both the culture and the serum have lost very slightly.

In fact he remains in ignorance of what has occurred.

On the contrary, if he avails himself of the principle of standardisation, he will make at the outset of the experiments a good quantity of killed, formalised culture, and will make a careful quantitative comparison of each new specimen with this standard suspension by means of a stock homologous serum. In this way he can work out a trustworthy curve of the rise or fall of agglutinability of the living culture. If his standard suspension runs out during the course of the research, he will have made a second one, and standardised it against the first. By means of the reduction factor the curve can be levelled at the point where he changed over to the second standard culture.

A Plea for Recognised Standard Type Cultures.

These two instances must suffice to illustrate the general applicability of the standard principle to quantitative agglutination work in any particular series of experiments, and we will pass on to the question of its wider application in the form of publicly recognised standard cultures for use in routine tests and as starting-points in research work.

So soon as properly conducted researches have succeeded in making a provisional serological analysis of a hitherto uncharted group of organisms, a central institute can be directed to manufacture[1] on a large scale standardised suspensions of the various type-strains which represent the most salient constituents of the group. It should be made clear to all who make use of these type-standard cultures that the act of official manufacture does not imply any dogmatic sense of finality as to the constitution of the group, but is simply a step taken for the convenience of workers in that field whereby fixed points are provided for the starting of further research.

Incidentally, the standard cultures may at once be tested on a large scale for the purposes of clinical diagnosis of infections with the group; and it can be determined which of them it is necessary to employ in order to secure the maximum of certainty in routine investigation. The Standards Institute would then adopt the policy of supplying the necessary cultures (and corresponding sera) to clinical workers in this field, together with an explanatory pamphlet.

The actual standardisation of the cultures and the proper use of the reduction-factor by clinical workers would ensure the uniformity of records, and thus facilitate the accumulation of material which would have a far greater statistical value than similar records obtained by an unstandardised method.

The minor advantages of a central supply of material for routine diagnosis were made obvious during the late war. These are reliability and sterility of the cultures and the saving of time to individual workers.

Since the cultures are standardised they can always be employed in tracing the rise and fall of the agglutinin curve in infected or inoculated persons or animals with a precision exceeding by far that obtainable with unstandardised suspensions.

Returning to the more important question of experimental work, I must explain more clearly how standard cultures may act as fixed points for further research.

A worker of repute has, for instance, classified a group of bacteria into two main types, and his work is confirmed, in the main, by other independent observers. The Standards Institute obtains his type bacilli, puts them through a thorough experimental investigation, and confirms the findings. So standard cultures are made with the type-strains and offered for circulation.

Another worker wishes to experiment upon the permanence of the stock types—i.e., to find out whether they do or do not alter their serological characters from time to time.

From what we have already seen, a proper standard technique is necessary if such a research is to obtain all the available evidence. This being so, it will be not only a convenience to the worker himself if he can obtain reliable standard cultures of the type-strains instead of having to start ab initio and make his own, but there will also be a definite gain to the scientific community in the fact that he will be using the same standard unit as everyone else for these type organisms, instead of erecting for himself, without any advantage to himself or anyone else, a new standard unit for each. For every strain used in his research other than the stock types he will have to make his own standard unit, until it be proved for certain that the strain is serologically identical with one of the stock types. If the work shows that the officially standardised strains do not adequately represent the whole group their number can, of course, be increased.

Now suppose that it has been conclusively shown that every strain of the group varies from time to time in serological characters, so that at one time a strain appears to be type A and at another time to be type B, and that its characters under no circumstances became fixed; then the principles of standardisation would no longer be applicable, for no single strain of the group would be a serological entity at all. Up to the present, however, no organism of any species has been shown to behave in this way, and therefore the principle holds good, in theory, for all bacteria.

We may ask, What is there in all this that can be objected to as limiting the individual freedom and confining the genius of experimental bacteriologists? The answer is—nothing. Those who believe in standardisation desire that a certain amount of pressure should be brought to bear (by persuasion) on workers to adopt the best technique available at any moment, and more particularly to employ a good and uniform standard of measurement in place of a bad and insulated one. They are convinced that Dreyer's system is by far the best technical method at the present moment, and is the only one which provides a really sound basis of measurement. We have seen that its application is confined at first to individual researches; then, as knowledge grows, provisional public standards may be adopted for the furtherance of research and for immediate clinical utility.

Finally, when the characters of an organism or of a group are established on a firm and unshakable scientific basis, we may settle down to an unqualified acceptance of universal standard cultures for the organism or types of the group, for use both in clinical work and in experiments of all kinds. Even this latter could never restrict the liberty of workers, who would always have perfect freedom to invent a better system and replace the old standards with better ones. It would, in fact, always be one of the first duties of a Standard Institute to work perpetually on the betterment of existing standards and the discovery of new ones.

[1] Or to supply standard suspensions to the manufacturers, and to check and control the circulation of the manufactured article.

EXPERIMENTS ON THE AGGLUTINATION OF *B. PARATYPHOSUS A.*

The advance of experimental method in bacteriology, as in all sciences, calls from time to time for a reconsideration of accepted doctrines; and in no question is this more frequently necessary than in that of the classification of bacteria. In the last few years there has been a strong tendency towards the subdivision of species, hitherto accepted as entities, into a variable number of types or fixed varieties. The pneumococcus, the meningococcus, Flexner's bacillus, the bacillus of influenza, and several pathogenic anaerobes have in turn been submitted to the analytic process. I am speaking of serological analysis, for this is a comparatively recent addition to the experimental outfit of a bacteriologist.

That in the great majority of cases these subdivisions reflect the truth to a greater or lesser degree I have no doubt; but it is often difficult to avoid the belief that the experimental technique employed has contributed an element of illusion to the findings. For instance,

the faith placed by many workers in the absorption method of Castellani does not seem fully warranted. Opinions of experts are divided as to its value, and my own experience has led me to support the view that it yields no true information unobtainable by simple agglutinations. When we find our agglutinations and our absorptions give discordant results, why should we assume that the latter have revealed to us a higher truth than the former? We are still very ignorant of the processes underlying our serological reactions, and, this being so, it seems the best plan to simplify the issue of our experiments by employing a straightforward method and, at the same time, sharpening it to the greatest possible degree of accuracy.

The Serological Identity of Strains of Paratyphoid A.

The experiments described in this paper prove, in my opinion, by simple agglutination tests the serological identity of all the strains of *B. paratyphosus A* employed. Were I, or another, to go over the same ground with absorption tests and discover diversity among the strains my deduction would be that this test, by its greater complexity, had led our judgment into error.

I do not know whether the serology of *B. paratyphosus A* has previously been closely investigated, but even if it had been it would be none the less desirable to work over the ground by means of Dreyer's technique, which is free from certain sources of error inherent in methods which include the use of unstandardised saline suspensions of bacilli. With Dreyer's method the same suspension may be examined and re-examined repeatedly over long periods, with the knowledge that its agglutinability is not changing. Every suspension thus provides a fixed point from which one may calculate variables—a scientific gain which cannot but be apparent to all.

Even with this technique we have certainly not yet mastered all the minor obstacles which stand in the way of consistently accurate measurements of the agglutinating power of sera. For instance, we have something to learn about the variability of agglutinating sera made with different cultures of a species—a phenomenon of which apparent instances are recorded by Topley, Platts, and Imrie,[1] and which undoubtedly deserves very careful investigation. It is my belief that all the apparent anomalies found by these workers in the case of *B. paratyphosus A* and possibly also of *B. paratyphosus B* are to be explained as technical variations, and not as evidence of serological variability. This is the teaching I have always had from Professor G. Dreyer, and every new investigation of my own has served to verify rather than to contradict it.

In the present paper I present tables of the comparative agglutinabilities of some strains of *B. paratyphosus A* when tested with a number of different sera, then I discuss some apparently anomalous results and demonstrate by experiment that they are due to the variable reaction-time of suspensions of poor quality.

The aim of the experiments was to establish prima facie evidence, with the limited material at hand, of the validity or invalidity of the view that *B. paratyphosus A* is a serologically uniform species.

Method:—In all essentials the technique employed was that recommended by Dreyer, under whom I have had extended opportunity of studying it. Thus formalised broth cultures have been employed throughout (0·1 per cent. of commercial formalin), and the suspensions were diluted with 0·1 per cent. formalised saline to a density similar to that of the suspension (standard culture para. A No. 27) which was used throughout as the standard of comparison. It happened that one suspension (para. A Charing X) was made, by error, distinctly thicker than the rest; and it is likely that this circumstance contributed something to the bad quality and irregular behaviour of this suspension. A single suspension of each strain was used throughout the comparative tests.

Some preliminary experiments were carried out by means of the short (Widal test) series of four tubes with a control. From the readings of these tests figures of relative agglutinabilities can only be calculated by means of Dreyer's reduction table.[2] Although this method is subject to a certain degree of error, since the table cannot be taken as fully applicable to paratyphoid cultures of variable quality, nevertheless these experiments have been included in the figures given in Table II. (two such tests with serum A 733 and one each with serum Charing X and B.W.); for the figures obtained were found in actuality to be little more variable than those gained by means of the long series of tubes which was used in the remainder of the experiments.

The most important advantage of the long series lies in its facilitation of direct comparisons of degrees of agglutination in any two series which are to be read against one another. Moreover, the fact that a number of readings can be taken reduces the error due to differences in the size of the individual tubes. Flocculation proceeds more rapidly in a relatively narrow tube than in a relatively wide one, and this influence may, in extreme cases, cause variations of 20 per cent. in a single reading.

In the water-bath the water level was kept constant, so as to cover about half the column of fluid in the tubes. This has been my practice since 1916, when it was adopted to accelerate the flocculation of dysentery cultures. Independent observations on the importance of this factor have been made and published by Topley and Platts.[3]

Readings were taken at two hours and again after 18 to 24 hours at room temperature. In the experiments on reaction-time, however, it will be seen that the tubes were compared after varying periods, up to 24 hours or more, in the water-bath. The usual readings taken were at least one coarse (standard) and one fine (trace) reading at two hours, and one fine reading at 24 hours. In some experiments only the finest obtainable readings were taken, since coarser readings, when cultures of bad quality are involved, provide much less accurate measurements of true agglutinability.

The sera were made by inoculating rabbits intravenously with one or more doses of formalised suspension of the bacillus. Serum B.W. was a commercial serum, possibly polyvalent; but unfortunately its history cannot be traced.

Strains of *B. paratyphosus A* examined.			Source.
1.	*B. para. A*	1	Denmark.
2.	,,	2	,,
3.	,,	3	(Brion-Kayser).
4.	,,	Cairo 1...	Egypt.
5.	,,	228	America.
6.	,,	335	France.
7.	,,	733	,,
8.	,,	Charing X	? England.

A number of others are included in Experiment I.

Section 1.—Determination of the Relative Agglutinabilities of Some Strains of B. paratyphosus A.

Table I. is included with the object of illustrating the fact that different suspensions of the same strain of *B. paratyphosus A* tend to show differences of agglutinability as great as those possessed by suspensions of different strains. All the strains but one came from a military hospital in France, and were never, so far as I know, put through any process of selection which could explain their fairly obvious homogeneity. The suspensions were mostly of poor quality for agglutination, as is so frequently the case with unselected strains of paratyphoid bacilli.

Table II. gives the results of cross-agglutinating eight strains of *B. paratyphosus A* obtained from all quarters of the world with three para. A sera. The figures obtained with serum 733 are averaged from four tests—those with serum Charing X from two tests, and those with serum B.W. spring from one test only. With the exception of culture A Charing X the deviations of the different figures from the mean are not wide enough to lend support to a theory of "serological strains." On the contrary, they may be taken as a demonstration of the uniformity of this group of cultures and sera from the serological point of view.

Culture para. A Charing X needs special consideration, since the wide variation of the figures obtained with it is highly suggestive of a serological variation. This question was therefore examined more closely, and it was found that the suspension was an exceedingly slow agglutinator—i.e., much more than two hours' incubation was required to bring it to its end-point of flocculation. In another respect also it was a very bad suspension, for its flocculation was always very incomplete.

Table VII. presents a reaction-time experiment performed with this culture (called culture Ch.X), wherein its velocity of flocculation is compared with that of a standard culture of good quality. Two different serums were employed, one homologous with culture O, the other with culture Ch.X. In both cases culture Ch.X shows a relatively very low agglutinability in the early stages of the incubation, but when incubated for longer periods manifests an agglutinability actually exceeding that of the standard culture.

The different effect of the two serums employed will be discussed below. From this experiment it is easy to see how such aberrant and variable figures as those in Table II. can be obtained with such a culture. Thus, an apparent exception to the serological uniformity of the strains dealt with proved on closer examination to be an unreality, due to the peculiarities of the particular suspension and not to a true serological divergence of this strain from the others. In a recent paper E. C. Hort[4] correlates vagaries in agglutin-

ability with the morphological characters of different suspensions. The few observations I have made on this point lend no support to his view, but it is one that calls for attention.

In Table III. is presented an additional series of experiments done with four of the same cultures as in Table II., but with the addition of two more serums. The figures represent the relative agglutinabilities of the cultures as found in a single test and calculating from two hours' readings only. With the exception of culture A 335 there is comparatively little variation in the relative agglutinabilities shown by the different cultures. 335 shows a much higher agglutinability with its own serum, and this might be taken as evidence of a true serological difference. It was therefore necessary to investigate the matter further by means of a reaction-time experiment. (See Table VI.) This culture was nearly as bad as culture A Charing X, and it proved to have a very slow flocculation-rate.

It has already been shown, in Table II., to be the second most variable suspension in the series. Its slow flocculability seems fully sufficient to explain how values so divergent as 175 and 88 can be obtained when different sera act upon the suspension and when the period of incubation terminates at two hours. The higher relative agglutinability manifested under the influence of homologous serum is discussed in detail in the next section.

Summary of Section 1.

In cross-agglutination tests of eight strains of *B. paratyphosus A*, obtained from widely different sources, with three different sera, and of four of the strains with five sera, no evidence was obtained of true serological differences among the strains. In two cases the figures were distinctly irregular, and were at first thought suggestive of true differences; but an examination of the specific behaviour of the two suspensions concerned led to the explanation of these differences by the incomplete, and, more particularly, extremely slow agglutinability of the suspensions. Prima facie evidence of the serological uniformity of the species has thus been established by means of a technique which allows comparative measurements to be made with considerable precision. To place the matter on a complete scientific basis a larger material will have to be examined.

Section 2.—The Rate of Flocculation of Formalised Broth Cultures of Paratyphoid Bacilli.

No one who has employed in a macroscopic technique a large number of suspensions of bacilli, either in salt solution or in diluted meat broth, can have failed to notice the irregular quality of suspensions of different strains and of successive suspensions of the same strain. They may be divided roughly into good and bad suspensions, according as they show complete flocculation with sufficient doses of a suitable serum, and a relatively rapid approach to the end-point of the reaction, or, conversely, a poor and partial flocculation and a slow reaction-time. Typhoid bacilli usually make good cultures, and paratyphoid bacilli commonly bad ones.

By a process of selection and cultivation in fluid media *B. paratyphosus A* can usually be induced to grow in such a way as to produce sufficiently good cultures, but failures are apt to occur even when these means are employed. Broth suspensions of para. A in the absence of special cultivation are more frequently bad than good, and cultures of para. B are, in my experience, almost invariably bad. In the manufacture of standard agglutinable cultures of the last-named organism this difficulty has been to a considerable degree overcome by the employment of a special selected breed of bacillus which grows spontaneously in loose clumps, the elements of which, when separated by a process of formalising, cold storage, and mechanical shaking, are peculiarly susceptible to rapid and complete flocculation by agglutinating sera. The occasional occurrence of colonies of this type of organism in platings of an ordinary *B. paratyphosus B* was demonstrated to me by Professor Dreyer, and I have had considerable opportunities of observing its characteristics, which will be described on some more appropriate occasion.

No such method of controlling the quality of para. A suspensions has yet been discovered, and the production of good material here has depended upon a process of selection combined with an element of chance. In the routine work of the Oxford Standards Laboratory success has not been uniform, and a great quantity of para. A culture has had to be discarded from time to time on account of its inferior quality. Occasionally during the war inferior cultures had to be issued, because demands were insistent and poor material was preferable to no material. Of such a nature were standard cultures para. A 23 and 32, which were among those employed by Topley, Platts, and Imrie in the research mentioned above. It is my belief that the discrepancies between their figures and the official ones in their Tables VII. and IX. particularly are an expression of the variability of the reaction and of the difficulty of observation of results obtained with second-rate material.

These facts, indeed, are a strong demonstration of the necessity of using good material for agglutination tests, and the best way of securing good material for all workers is by having it produced in properly equipped central institutes by specially trained persons who have the leisure to investigate the causes of inferiority in cultures and the means of improving them. It seems that fluid cultures of paratyphoid bacilli (and probably all bacteria) are composed of elements of variable agglutinability. When the conditions of growth favour the more highly agglutinable individuals a culture of good quality results, but in another set of conditions the elements of low sensitiveness outgrow their fellows, and the resulting culture is a bad one. All varieties, even down to apparently inagglutinable cultures, may occur. But the average bad culture seems to consist of a majority of bacilli which fail to flocculate within the time of observation and a minority which are readily flocculated. The latter, however, being scattered through the fluid, take a considerable time to come into contact with each other and so to form visible clumps. Convection currents in the fluid naturally facilitate the meetings of these elements, and so we find that the exposure of the upper part of the tubes to a lower temperature than the lower part has an even more evident accelerating effect on bad than on good cultures.

Table V. presents a simple case of a bad culture (para. A 34) with a slow reaction-time. At the end of three hours at 50–55° C. the good culture (A 27) appeared to be 4·17 times more sensitive than the bad one. Later reading of the tubes kept at the same temperature showed a progressive change in the ratio of agglutinability, until at 24 hours it was found to be only 1·22.*

TABLE I.

Twelve 24-hours' broth cultures of various strains of *B. paratyphosus A* roughly formalised and diluted to approximately the same opacity and agglutinated simultaneously by a serum made with strain 733. Short series of tubes. Date of experiment 19/3/1918.

Name of strain.	Date of stock culture from which broth culture was taken.	Actual readings (2 hrs.)		
		1/100	1/250	1/500
Para. A 335	15/6/16	t. –	? tr.	0
,, 333	17/6/16	t. –	0	0
,, Cairo 1	25/8/17	t. –	tr. +	0
,, 627	17/6/16	t. –	0	0
,, 674	29/6/16	t. –	0	0
,, 666	27/12/15	t. –	0	0
,, 360	17/6/16	t. –	0	0
,, 733	29/1/17	t. –	? tr.	0
,, 733	6/6/17	t.	s.	0
,, 733	22/2/18	t. –	tr. –	0
,, 733	18/3/18	t. –	0	0
,, 733	23/1/18	t. –	s. –	0

Symbols used.—t. = total; s. = standard (partial); tr. = trace of agglutination. The minus or plus sign appended signifies that the degree of agglutination was somewhat less or somewhat greater than the symbol states.

This experiment illustrates the view that different cultures of the same strain of this species show fluctuations of agglutinability as wide as those found in cultures of different strains.

TABLE II.

Cultures.	Sera.				Errors.			
Para. A.	S. 733	S. Ch. X	S. B.W.	Mean.	S. 733	S. Ch X	S. B.W.	Mean
1	94	130	126	117	19·7	11·1	7·7	9·5
3	73	60	63	65	12·3	7·7	3·8	7·9
228	142	144	142	143	0·7	0·7	0·7	0·7
Cairo 1	162	183	150	165	1·9	10·9	9·1	7·3
335	200	140	175	172	16·3	18·6	1·7	12·2
Charing X	800	136	346	(422)	(90·0	64·0	18·1	57·7)
2	87	119	106	104	16·3	14·4	1·9	10·9
733	100	100	100	100	—	—	—	—
				Average	11·2	10·6	4·1	8·1

The figures given are the relative serum quantities required to agglutinate the various cultures to the same degree (2 hours' and 24 hours' readings averaged). They are therefore reciprocal to the relative agglutinabilities of the cultures.

* It was observed long ago by Dreyer and Jex-Blake (1905)[5] and Dreyer and Douglas (1910)[6] that an improvement in the accuracy of comparative readings was obtained by a second reading of their tubes after some 18–24 hours at room temperature. They worked, naturally, with suspensions of good quality, which do not need a prolonged incubation period to attain maximal flocculation.

TABLE III.

Five sera with four cultures (single tests).

Cultures.	Sera.				
	Para. A 2.	Para. A (B.W.).	Para. A 335.	Para. A Charing X.	Para. A 733.
A 733 ...	100	100	100	100	100
A 228 ...	135	130	105	145	133
A C1 ...	147	139	141	167	141
A 335 ...	—	175	88	141	135

The figures represent the reciprocals of the relative agglutinabilities of the four cultures with each serum. A 733 (a stock standard suspension) taken as unity in every case. Two hours' readings only.

TABLE IV.

Time in water-bath.	Serum A 41.		Serum A 29.	
	Cult. A 14.	Cult. A 29.	Cult. A 14.	Cult. A 29.
1 hr.	100	133	100	91
3 hrs. 40 m. ...	100	79	100	69
6 ,, ...	100	76	100	66
23 ,, ...	100	67	100	54

The figures represent the relative quantities of serum required to give a trace of agglutination. The table shows that Cult. A 29 has a slow flocculation-rate with both sera, compared with Cult. A 14. There is an indication of a slight acceleration by its own serum in the first hour.

TABLE V.

To show the slow rate of flocculation of a bad para. A culture.

Time in water-bath.	Cultures.	
	Para. A 27.	Para. A 34.
3 hours	100	417
5½ ,, ...	100	180
10 ,, ...	100	135
24 ,, ...	100	122

Para. 27 is a good culture; para. A 34 a bad one. Figures represent the relative quantities of serum required to give a trace of agglutination.

TABLE VI.

Serum A.				Serum B.			
Incubation time.	Quantities of serum.		Ratio.	Incubation time.	Quantities of serum.		Ratio.
	Cult. A.	Cult. B.			Cult. A.	Cult. B.	
½ hr.	0·600	>1·00	>1·67	½ hr.	0·640	0·800	1·25
1¾ hrs.	0·200	0·275	1·38	1¾ hrs.	0·300	0·263	0·88
6¼ ,,	0·150	0·145	0·97	6¼ ,,	0·245	0·187	0·76
24 ,,	0·140	0·100	0·71	24 ,,	0·200	0·140	0·70

Serum A and culture A = Oxford Standard para. A culture No. 27 and homologous serum (strain para. A 733). Serum B and culture B = serum and formalised suspension made with strain para. A 335. The reading given in every case is that of the finest trace of agglutination observable.

TABLE VII.

Serum O.				Serum Ch. X.			
Incubation time.	Quantities of serum.		Ratio.	Incubation time.	Quantities of serum.		Ratio.
	Cult. O.	Cult. Ch. X.			Cult. O.	Cult. Ch. X.	
2 hrs.	0·40	>1·00	>2·50	2 hrs.	0·30	0·35	1·17
4½ ,,	0·30	0·45	1·50	5 ,,	0·29	0·20	0·69
				7 ,,	0·25	0·16	0·64
22 ,,	0·25	0·15	0·60	22 ,,	0·22	0·13	0·59

Serum O and culture O = Oxford Standard para. A culture No. 27 and homologous serum (strain para. A 733). Serum Ch. X and culture Ch. X = serum and formalised suspension made with strain para. A Ch. X. In every case the reading is that of the finest trace of agglutination observable.

It must be noted that trace-readings only are used in the comparison. Coarser readings would give different ratios at all stages, and by their means it would not be possible to judge the true agglutinability of the bad culture, for it is only the agglutinability of its most sensitive bacilli that can be properly estimated. This being so, it is easy to see how different observers may arrive at different ratios of agglutinability when working with inferior suspensions. The culture para. A 34, though intended for a standard agglutinable culture, was withheld from issue by the Standards Laboratory on account of its bad quality.

Variations in Behaviour of Different Specific Serums.

Before entering further into the question of reaction-time some observations must be made concerning certain variations that occur in the behaviour of any pair of para. A suspensions when acted on by a number of different specific sera. Without assuming to lay down any rules of universal validity, I will state shortly the opinions to which experience has led me.

(1) A pair of good suspensions will give an almost, but not quite, identical ratio of agglutinability with all specimens of specific serum.

(2) The small differences of ratio are real and permanent, reproducing themselves constantly when the same pair of cultures are re-tested with the same serums after a year or more.

(3) The worse the quality of the culture the more pronounced do these differences become.

(4) A bad culture shows during the early hours of incubation a relatively greater sensitiveness when tested with its homologous serum than with heterologous sera. Possibly all cultures show this to some degree. Heterologous sera vary in their effects on a bad culture. Some agglutinate it more rapidly than others.

The special effect of homologous serum can be explained as an increase in the velocity of flocculation, which may perhaps mean that a larger number of elements is capable of being flocculated readily by this serum than by other sera. If a special term be needed as a label for it I suggest "super-specific acceleration."

This phenomenon must be taken into account in the interpretation of cross-agglutination and absorption tests on different strains of a species. So far as my experience with the "enteric group" goes, it is only one of several dimly understood phenomena, each of which may in certain circumstances lead our judgment astray. "Super-specific acceleration" seems to be important only when poor suspensions are in use. There is, indeed, a body of opinion that accuses agglutinin reactions of tending sometimes to give rise to unreal subdivisions of bacterial entities,[7] and we must assuredly adopt a rigidly sceptical attitude in interpreting our experimental results. Tables VI. and VII. provide good examples, similar to that in Table V., of agglutination tests which could not fail to be misinterpreted if a short-period reading were the only one taken. In each of these experiments a bad culture was measured against a good one, using first the serum homologous to the one culture and then the serum homologous to the other. In both alike the ultimate ratio of agglutinability after long incubation is identical. In both alike the bad culture has the slower flocculation velocity, and in both its velocity is very much higher with homologous than with heterologous serum. The bad culture C.X in Table VII. is the culture para. A Charing X of Table II. So imperfect was the flocculation of this suspension that even the strongest serum dilutions caused only partial agglutination. Attention was called to it as the only culture which showed such serious fluctuations with the different sera as to throw doubt upon its identity with the rest of the strains.

We are now in a position to form a truer judgment. Table VII. shows clearly how variable may be the ratios found unless prolonged incubation is carried out; but that, when it is carried out, the two ultimate ratios are the same.

It is easy to imagine that, with a suspension even more refractory than this one, one might fail altogether to reach the real end-point when using any but the strictly homologous serum. A precisely similar experiment is given in Table VI. Here the bad culture is para. A 335, which was seen in Table II. to show a degree of variability greater than any save para. A Charing X.

In the present table it manifests a variation similar in direction but inferior in magnitude to that of para. A Ch.X in the last table. Even when a pair of suspensions of the same strain are tested in this way first with a serum made with the one suspension, and then with a serum made with the other, there seems to be a tendency to this super-specifically elective action, but I have not made any sufficient experimental examination of this point.

Whether or no it can all be explained by reaction-time phenomena, there is no doubt that the ratio of agglutinability of any pair of suspensions may show definite and constant differences of a minor degree when the cultures are agglutinated by different sera.

The available evidence does not point to strain specificity as the true explanation of these minor differences, but rather to the interaction of other chemical or physical properties of the sera and the suspension, properties which must always

vary to a certain degree. The matter is, however, of sufficient importance to warrant a special investigation.

My thanks are due to Professor Dreyer for various suggestions, and to Miss J. Jorgensen for help in some of the experiments.

Summary.

1. Evidence is brought forward of the serological uniformity of a number of strains of *B. paratyphosus A* of widely different origins.
2. This constitutes prima facie evidence of the serological uniformity of the species.
3. Certain irregularities in the behaviour of some of the cultures are shown to be due to the variable rate of flocculation of inferior suspensions.
4. The greater sensitiveness of certain cultures to homologous strain sera is shown to be at least partly a reaction-time phenomenon, for which the term "super-specific acceleration" is suggested.

References to Part II.—1. Medical Research Committee's Special Report, Series No. 48, 1920, Part I. 2. Dreyer, G., and Inman, A.C.: THE LANCET, July 31st, 1915. 3. Topley and Platts: THE LANCET, 1918, i., 800. 4. Hort, E. C.: Jour. of Hyg., vol. xviii., No. 4, p. 361, 1920. 5. Dreyer and Jex-Blake: D. Kgl. Danske Vidensk. Selsk. Skrifter, 7, Raekke Afd., April 1st, 1905, and Jour. of Path. and Bact., 1906, p. 1. 6. Dreyer and Douglas: Jour. of Path. and Bact., 1910; Proc. Roy. Soc., B., vol. lxxxii. 7. E.g., Tulloch, re *B. tetani* in Medical Research Committee's Special Report, Series No. 39.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF

CESSATION OF RESPIRATION

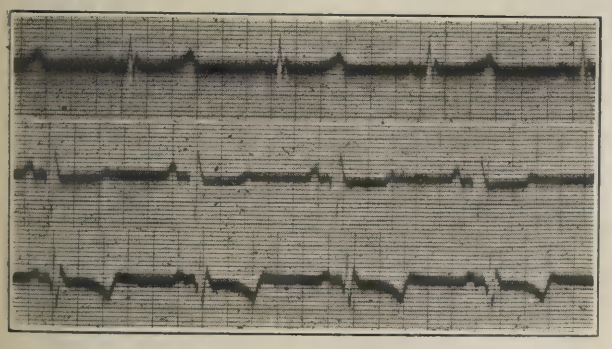
FIFTEEN HOURS BEFORE DEATH.

BY H. WALLACE JONES, M.SC., M.D. LIVERP.,
HONORARY ASSISTANT PHYSICIAN, LIVERPOOL ROYAL INFIRMARY.

THE chief interest of the following case of cerebral hæmorrhage lies in the length of time during which the heart went on beating after spontaneous respiration had ceased and in the opportunity afforded of obtaining an electrocardiograph of the heart.

A married woman, aged 50, was brought to the Royal Infirmary unconscious and cyanosed with the history that she had suddenly become dizzy and fallen to the ground.

On admission she was markedly cyanosed and respiration had ceased. Her heart, however, was beating regularly and with considerable force at the rate of 120 per minute. Corneal reflexes were absent and no knee-jerks could be elicited. The pupils were equal and widely dilated.



Electrocardiogram taken in a case of cerebral hæmorrhage 12 hours after spontaneous respiration ceased. The vertical lines denote fifths of a second.

Artificial respiration was commenced at once and her colour rapidly became normal, the pulse-rate falling from 120 to 72 per minute; this was continued for two hours, during which time she made no respiratory effort.

It was then decided to use intratracheal insufflation of air, using Mr. R. E. Kelly's apparatus, which kept the patient's colour normal, the heart continuing to beat strongly as before. Lumbar puncture revealed normal cerebro-spinal fluid under slightly increased tension; the optic discs were normal, and the urine contained a slight trace of albumin but no casts. A surgical colleague was consulted with a view to performing a decompression, but as there were no localising signs it was not thought to be justifiable. The insufflation was continued until the heart ceased to beat, 15 hours after admission.

The accompanying electrocardiograph was taken 12 hours after spontaneous respiration had ceased, and shows normal rhythm with some lengthening of the ventricular complex, which occasionally exceeds half a second in duration. Post-mortem examination showed a recent hæmorrhage in the right cerebral hemisphere destroying the internal capsule; both the lateral ventricles were filled with blood, and there was some flattening of the convolutions. The medulla and pons were normal; signs of general arterio-sclerosis and chronic interstitial nephritis were present.

NOTE ON A CASE OF

PRIMARY DIFFUSE ALVEOLAR CARCINOMA OF THE LUNG.

BY A. KNYVETT GORDON, M.B. CANTAB.

A SPECIMEN, consisting of a portion of the upper lobe of the right lung, was sent to me for investigation by Dr. C. L. Lander, of Devonport, to whom I am indebted for the clinical notes of the case.

The patient, a woman aged 56, was well until four months before her death. The illness began with cough and dyspnœa, with very little expectoration and no hæmoptysis; she grew steadily worse, and took to her bed two months later. During the last month of her illness she suffered from severe attacks of dyspnœa with pallor, sweating, and rapid pulse. The physical signs were those of consolidation of the right lung.

Post mortem the whole of the right lung except the inferior portion of the lower lobe was infiltrated with a homogeneous mass of growth, the pleura being adherent and thickened throughout. There was no sign of disease in any other organ, nor were there any obvious metastases; the bones, however, except the clavicles, were not examined.

Macroscopically, the specimen exactly resembled a portion of lung in the grey hepatisation stage of lobar pneumonia. It was homogeneous throughout, and there were no signs of cavitation or breaking down of tissue.

On microscopic examination the alveolar structure of the lung was seen to be well preserved, but each alveolus was filled with a papillomatous collection of columnar epithelial cells arranged on a delicate fibrous support of a dendritic structure, bearing, in fact, a striking resemblance to a miniature villous papilloma of the bladder. Beyond slight post-mortem changes there was no gross or localised necrosis. The bronchi were unaffected, and there was no evidence of concomitant tuberculosis. The pleura was thickened by chronic inflammatory change, and adherent.

The interest of the specimen lies in its rarity. Primary carcinomata of the lung are said to form about 1 per cent. of all carcinomata, and of these the great majority are of the squamous- or spheroidal-celled variety, arising either from the bronchial mucosa or glands. The alveolar carcinomata are again divided into the nodular and diffuse varieties, of which the nodular is the more common. The type represented by this specimen is therefore almost a pathological curiosity. In view, however, of the clinical and pathological similarity between this type of alveolar carcinoma and lobar or lobular pneumonia it is possible that the disease may not be so uncommon as appears.

Bedford-square, W.C.

A CASE OF

CONGENITAL SUPRAPUBIC HERNIA.

BY F. M. NEILD, M.B., B.S. LOND.

WHILE examining coolies for the Chinese Labour Corps at Tsingtau in the spring of 1917 I came across a number of deformities and abnormalities. Among them was a case of suprapubic hernia of a type I have not seen described, though two cases of suprapubic hernia due to divarication of the recti have been published.

As the coolie presented himself for examination a rounded swelling about the size of a grape-fruit could be seen above and overhanging the pubes. On examination this proved to be a hernia with very thin coverings. The whole could easily be reduced and inverted within the abdominal cavity. The opening easily admitted the whole hand, and the entire pelvis could be explored. Above, the ring was arched and on each side attached below to the symphysis pubis. The edges felt sharp and were quite unyielding. The lower and narrower boundary was formed by the os pubis. The penis, scrotum, and inguinal canals were normal

and the coolie was otherwise well developed. He stated that he had had the hernia all his life, that it did not tend to get any bigger, and did not interfere with his work. There were no urinary symptoms.

For lack of time I was not able to make a more detailed examination. The possibility struck me that it was due to absence of the lower ends of the recti and pyramidales muscles.

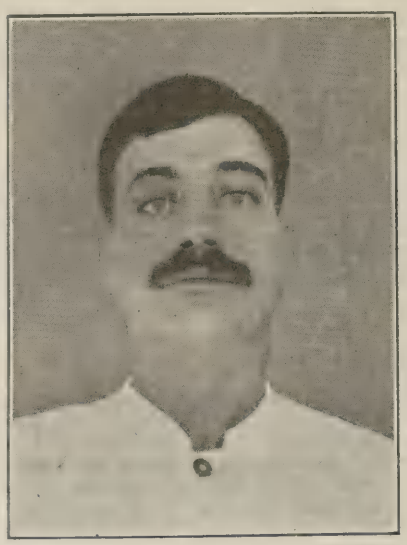
Shanghai.

A CASE OF MIKULICZ'S DISEASE.

BY S. G. ASKEY, M.A., M.D., B.CH. CANTAB.

THE patient whose photograph is reproduced was 28 years of age, and came under my care in India with chronic amœbic dysentery. The parotid glands were greatly enlarged, of uniformly tough consistency, and not tender. The lacrymal glands were about twice their normal size. There was also some enlargement of the submaxillary and sublingual glands. The man stated that he had noticed his face gradually increasing in width for about three years. The thyroid was not enlarged, the spleen was not palpable, and the lymphatic glands of the axillæ and groins were not increased in size.

The literature of the disease is meagre and chiefly continental. Mikulicz observed the condition in 1888 and first described it in 1892. The ætiology is unknown,



Mikulicz's disease, showing glandular enlargement.

and the disease has been variously ascribed to (1) a general infection; (2) a local infection; (3) a primary neoplasmosis. Histologically the enlarged glands show some of the appearances of sarcoma, but though slowly progressive the enlargement is in no sense malignant. I have seen one case of 15 years' duration. Pressure from the enlarged lacrymal glands sometimes causes impairment of vision, and the eyeball may be displaced downwards and inwards. The glandular enlargement is said to subside during an acute intercurrent illness, or after removal of the main portion of the lacrymal glands. A number of drugs have been recommended for the treatment of the disease—arsenic, iodides, sodium cacodylate, pilocarpin, Coley's fluid, thyroid extract, and X rays have been tried, but without much effect. It is interesting to note that most of the cases described have occurred in coloured persons.

References.—Mikulicz, J.: Ueber eine eigenartige symmetrische Erkrankung der Thränen- und Mundspeicheldrüsen, Beit. z. Chir. Festschr., Theodor Billroth, Stuttg., 1892, 610–630. Posey: Trans. Col. Phys., Philadelphia, 1916, third series, vol. xxxviii., 345. Pooley, G. H., Paton, L., Elliot: Proc. Roy. Soc. of Med., 1916, vol. ix., part iii.

Highgate.

Reviews and Notices of Books.

RHEUMATISM AND ARTHRITIS.

By RALPH STOCKMAN, M.D., Professor of Materia Medica and Therapeutics in the University of Glasgow, and Physician to the Western Infirmary, Glasgow. Edinburgh: W. Green and Sons, Ltd. 1920. Pp. 132. 15*s*.

So many gaps exist in our knowledge of the so-called "rheumatic diseases" of joints that insuperable obstacles bar the way to anything approaching finality in the description and classification of these disorders. The exact clinical differentiation of several of the members of the group is still scarcely possible, and the inherent difficulties of the whole subject are added to by the confusion among authors as to nomenclature and morbid anatomy of these diseases. The present writer has largely confined himself to recording the results of his own clinical and pathological observations and theorising has been sparingly embarked upon. Historical notes are appended to the description of the various disorders and these go far to clear up the confusion of nomenclature to which we have already referred. Indeed, we think the author has rendered a signal service to the serious student by their inclusion. The term fibrositis is used by the author as synonymous with chronic rheumatism—that is, chronic inflammation of the white fibrous tissue of the body. Chronic inflammation of the areolar tissue of the panniculus adiposus is referred to as panniculitis. The morbid anatomy and causation of this condition do not differ in essentials from what is found in fibrositis, with which it may coexist. A short chapter is devoted to Dupuytren's contraction of the palmar aponeurosis, and "claw-foot" is regarded as an analogous state. A lengthy chapter is set apart for the consideration of chronic non-suppurative arthritis, under which term the author includes rheumatoid arthritis and several ill-defined conditions which at present can only be differentiated from one another to a very limited extent, and which are collectively referred to as chronic infectious arthritis. This is followed by chapters dealing with purpura rheumatica, gonorrhœal rheumatism, arthritis of known causation—e.g., pneumococcic arthritis—and osteo-arthritis. Heberden's nodes have an interesting chapter devoted to their consideration. They are described as the result of a periostitis and osteitis rather than of osteo-arthritis. It is noteworthy that while all writers subsequent to Heberden describe the condition as a mild form of osteo-arthritis, yet Dr. Stockman in examining specimens has never met with the changes characteristic of true osteo-arthritis. The book closes with a consideration of coxa vara, hypertrophic osteo-arthropathy, and of nervous arthropathy. Little new light is thrown on the treatment of the conditions so lucidly described, and we are of the opinion that the chief merit of the book lies in helping to remove the state of mental confusion and incertitude which besets the student entering upon the investigation of "chronic rheumatic disease." The book is printed in clear type and is well illustrated by numerous photographs.

OPERATIVE SURGERY.

A companion volume to a "Manual of Surgery," Vols. I. and II. Third edition. By ALEXIS THOMSON, F.R.C.S. Edin., and ALEXANDER MILES, F.R.C.S. Edin. London: Henry Frowde and Hodder and Stoughton. 1920. Pp. 619. 16*s*. net.

THIS text-book of operative surgery, of which a new edition has been published, is well known and has long been valued. The text has been largely rewritten and rearranged, and matter has been added on some subjects which have undergone recent developments, such as artificial limbs and blood transfusion. A brief account of the main points in surgical anatomy has also been added. Although the number of the pages

has not been increased, a considerably larger amount of text has been printed on each page. Nevertheless, it is not possible in 600 pages to give a detailed description of most of the operations. Important operations are, indeed, barely mentioned, and in many cases the beginner using this book as his sole guide could hardly carry out with success the operations described.

The book is evidently intended for students who are acquiring an elementary general knowledge of surgical procedure rather than for those who are themselves engaged in the practice of operative surgery. With this fact in view we are less inclined to criticise its plan than we should otherwise be. Nevertheless, even though the student may acquire from the book a standard of knowledge adequate for the ordinary examinations in surgery, we regard it as unfortunate that it has not been brought thoroughly abreast of advances in surgical procedure. To take an instance. In the remarks on the technique of nerve suture, in which nerve-grafts and nerve-bridging operations are apparently considered quite satisfactory, a wrapping round the site of the suture seems to be regarded as essential, and no mention is made of the importance of preserving a small interval between the ends inside the sheath. In these points the authors run counter to recent teaching. Again, among the brief remarks on bone-grafting, no reference is made to Albee's "sliding graft," which is rapidly coming to the fore as the operation of choice in many cases, instead of plating or wiring. In the description of skin-grafting the free graft of the whole skin thickness, as distinguished from the pedicled graft, and various essential details of technique are not mentioned. After reading the authors' account of the time-honoured operations for placing an imperfectly descended testicle in the scrotum any student might suppose that they were found satisfactory in practice, whereas in fact they almost invariably fail. The only operation which does give some measure of success—namely, passing the testicle through the scrotal septum—is not mentioned. Syme's amputation of the foot is still described in the classical manner in spite of the fact that evidence accumulated during the last six years shows that a much higher section through the tibia and fibula gives better after-results.

Such instances might be multiplied. It is shortcomings of this kind, far too familiar in text-books of repute, that make the student distrustful, for he is taught in this way opinions and procedures which have long been modified or discarded in practice.

QUATRE LEÇONS SUR LES SÉCRÉTIONS INTERNES.

Par E. GLEY, Professeur au Collège de France; Membre de l'Académie de Médecine. Paris: J. B. Baillière et Fils. 1920. Pp. 160. Fr. 6.

THESE four lectures were originally delivered in Barcelona before the Société de Biologie in December, 1917. In compiling the present brochure certain additions to our knowledge of secretion of more recent date than the lectures, as well as a bibliography, have been added. The lectures do not claim to give an exposition or even a summary of the chief facts relating to the endocrine organs; they rather concern themselves with the method to be followed in researches on these organs and with the laws governing their mode of action—that is to say, the subject is approached from the physiological rather than from the medical point of view. The first lecture presents a critical exposition of the theory of internal secretion. The second examines the question as to what the essential function is which must be fulfilled before a gland can be regarded rightly as an endocrine organ. The third criticises the methods which too often have been employed in the past, and indicates the rational procedures which alone should be used in the study of internal secretion. The fourth lecture summarises the results which have been obtained up to the present time, and discusses their biological significance. The conclusion reached is that, despite mistakes of research in the past, the new ideas springing from the facts already obtained constitute a veritable revolution in biological knowledge.

A TEXT-BOOK OF PATHOLOGY.

Delafield and Prudden's Text-Book of Pathology. Revised by FRANCIS CARTER WOOD, M.D. Eleventh edition. London: John Bale, Sons, and Danielsson, Ltd. 1920. With 15 plates and 809 illustrations in the text. Pp. 1354. £3 3*s*.

IT is becoming increasingly difficult to present the facts and theories of general and special pathology in a single volume; indeed, the task can only be accomplished by a process of rigorous pruning, and the attempt to include methods of technique is calculated to jeopardise its success.

In the eleventh edition of this well-known text-book the original plan has been adhered to, and the section dealing with the methods of making post-mortem examinations and with the preparation and examination of pathological tissues has been retained, though the hundred or more pages thus occupied might have been liberated with advantage for use in other sections. This adherence to tradition is, we think, regrettable, and the numerous references in the text to "the scope of this book" seem to show that the editor is conscious of the limitations which he has imposed upon himself. Certain important processes undoubtedly receive less attention than they merit. The description of œdema, for example, is very brief, and it is surely within the scope of any text-book of pathology to discuss the formation of anæmic and hæmorrhagic infarcts. On the whole, however, the necessary compression has been carried out wisely and well, and the text has been supplemented by copious references to the literature.

For this edition the text has been carefully revised and several of the chapters have been practically rewritten. Many excellent illustrations have been added, and we are confident that the work will continue to enjoy its justifiable popularity.

AMERICAN POCKET MEDICAL DICTIONARY.

Eleventh edition. Edited by W. A. NEWMAN DORLAND, A.M., M.D. London and Philadelphia: W. B. Saunders Company. 1919. Pp. 771. 7*s*. 6*d*.

THE last edition of this admirable desk companion contains several hundred new terms and bears evidence of careful revision. The preface states that the total sales to date of the pocket dictionary, since its first appearance in 1898, have amounted to over 185,000 copies. Suggestions and lists of new words sent by readers have been freely used in revision. Besides the strictly alphabetical arrangement, the dictionary contains 75 tables in which correlated facts are grouped. The only questionable feature is the table of doses (both for man and beast) in the metric system, given to three or more places of decimals, and well calculated to put the aspirant off the metric system for life—e.g., the dose of osmic acid is given as 0·00108 g. This is doubtless the correct mathematical equivalent of $\frac{1}{60}$ gr., but in practice the last two figures have no significance whatever. We appeal to the editor to use his vast circulation to popularise a rational use of the metric system.

THE DOCTOR'S MANUAL.

Or Practitioner's Vade-Mecum. With which is incorporated "How to Cut the Drug Bill." By A. HERBERT HART, M.S. London: John Bale, Sons, and Danielsson, Ltd. 1920. Pp. 256. 10*s*. 6*d*.

THIS is the fourth, or as the author puts it post-bellum, edition of a volume which has proved of value to the medical practitioner in its earlier forms. Dr. Hart is not one of those moderns who has no use for galenicals; he is a believer in the value of simple old-fashioned mixtures, and he tabulates with commendable detail a hundred or so of prescriptions which he has himself found useful in practice, grouping them under code letters for ease of reference and remembrance. This list forms the bulk of the first or older part of the book. The second part contains short practical chapters on anæsthetics, antipyretics, antiseptics, spas and mineral waters, invalid foods, and biological therapy. There is no attempt at scientific treatment, but the

practitioner will find useful practical details of where to obtain and how to use. The third part is an alphabetical synopsis of treatment which the author must have intended to be suggestive rather than complete. Mr. Frank Kidd, whose portrait is placed by the author on the title-page, contributes a special article on Venereal Disease, terse and to the point. The appendix contains a curious but quite serviceable assortment of tables for the practitioner's reference.

THE EXTRA PHARMACOPŒIA.

Seventeenth edition, in two volumes. Vol. I. Revised by W. HARRISON MARTINDALE, Ph.D., Ph.Ch., F.C.S.; and W. WYNN WESTCOTT, M.B. Lond., D.P.H. London: H. K. Lewis and Co., Ltd. 1920. Pp. 1115 + xl. 27*s*.

A NEW edition of Martindale and Westcott's well-known and widely appreciated Extra Pharmacopœia is welcome. It is five years since the last edition (sixteenth) was published, many innovations have occurred since, and these are here comprehensively and faithfully dealt with. The work is a storehouse of accurate information and reference of value to medical practitioner and pharmacist alike. The former will note paragraphs dealing with the organic arsenic and antimony compounds, new coal-tar derivatives such as acriflavine and proflavine, the colloidal metals and non-metals, emetine, thorium compounds, and the vitamines. The latter will find an instructive and practical account of the manufacture of organic chemicals previously produced abroad. The successful preparation of these chemicals should, the authors hold, become more a matter of common knowledge. Many substances of admitted therapeutic value are the subjects of expired British patents, while their exact methods of production and their formulæ are uncertain. The Extra Pharmacopœia contains helpful information on these points, which should enable the qualified reader to obtain a satisfactory product by equally satisfactory procedure. The list of drugs coming within this category dealt with in the book seems exhaustive. There are chapters on vaccines; the authors set out the evidence in favour of the detoxicated vaccines. Throughout the whole work there is conspicuous evidence not only of thoroughness in actual compilation, but of personal investigation into many questions of importance in modern therapeutics. The Extra Pharmacopœia is not a text-book of pharmacology; it is not a critical digest of clinical experience. It does not set out to be either of these things; but within its limits, and with its records of pharmacological experiences, it is a book which the sister professions of medicine, pharmacy, and chemistry will consult with reward and advantage. Vol. II., to be issued later, deals with experimental work connected with the assay of chemicals and drugs, and contains sections on the composition of proprietary medicines, mineral waters, iontophoresis, radiology, with the addition of bacteriological and clinical notes. The Extra Pharmacopœia is one of the few books which medical practitioner, analyst, and pharmacist cannot afford to be without.

A SCIENTIFIC EXPLANATION OF CHRISTIAN SCIENCE.

By MICHAEL B. SHIPSEY, M.B., B.Ch. Birm. Birmingham: Cornish Brothers, Ltd. 1920. Pp. 23. 9*d*. net.

EVERY medical man knows that given two patients suffering from, say, pneumonia, the one who makes up his mind that he is going to recover will, cæteris paribus, be more likely to do so than the other who makes up his mind that he is going to die. In a way this is the principle upon which Christian Science goes, and thus far its doctrine may be sound. Dr. Shipsey has endeavoured to put the facts upon a scientific basis. Shortly, his thesis is as follows. Intense concentration of the mind upon anything is accompanied by a holding of the breath. Prayer is an intense concentration of the mind and equally a holding of the breath. In the case of a wounded or diseased part, the blood with its gases is forced by the guidance of the brain into the affected part, which thus gains an extra blood-supply together with an increased supply of nervous stimuli. There is nothing impossible here, but when Dr. Shipsey comes to physiological and psychical matters he seems to us to flounder dismally. For instance, he says "the mind is really the animal electricity residing in the entire body, and when you concentrate the 'mind' on any particular part of the body it means that an excessive amount of animal electricity is sent to that part. ..... When you look at an object in the distance a current of animal electricity (however feeble) passes to that object from the mind, setting up the process of vision in the brain." Again, "it has been well said that it is almost as hard to get a belief out of the human mind as it is to get the green colour out of a green leaf." Now nothing is more easy than "to get the green colour out of a green leaf," as any cook who has ever coloured food with spinach could tell Dr. Shipsey.

JOURNALS.

Quarterly Journal of Experimental Physiology. Editors: E. SHARPEY SCHAFER, W. D. HALLIBURTON, C. S. SHERRINGTON, E. H. STARLING, A. D. WALLER. London: Charles Griffin and Co., Ltd. 1920. Vol. XII., No. 4. Pp. 303–401. 10*s*.—The Histology of Tadpoles Fed with Thyroid, by R. K. S. Lim. Previous observers have determined that the feeding of larval amphibians on thyroid and other endocrine glands determines a precocious differentiation of the body, with suppressed further growth. Tadpoles of *Rana temporaria* were fed at various periods after hatching, the majority with water-extracts of both fresh and desiccated (sheep) materials and with some pond weed. Microscopic studies were made on several series of tadpoles at different ages, and it was found that the nearer the animal is to metamorphosis the more intense is the effect of the thyroid; moreover, the effect appears to vary directly with the dose. Microscopic study shows that thyroid "accelerates the ageing," the number of mitoses are increased and developed, and consequently metamorphosis is induced and hastened. All organs appear more "adult" in character. The alimentary canal is first to be affected, a large thin-walled larval type of intestine being replaced by small, thick-walled type. Masses of pigment accumulate in the mucosa and may break through the epithelium. Thyroid-induced metamorphosis results in rapid absorption of the tail, the caudal muscles being disintegrated partly by phagocytes and partly by autolysis. The phagocytes loaded with muscle debris simulate eosinophil leucocytes, wander into the circulation and eventually are extruded through the intestinal mucosa. The number of blood corpuscles undergoing mitosis is increased. In general, normal processes are hastened and exaggerated by excess of thyroid hormones.—Observations on the Glycogen Content of Certain Invertebrates and Fishes, by L. G. Kilborn and J. J. R. Macleod. Using Pflüger's method for determining the amount of glycogen, it was found that the hepatopancreas of representatives of asteroidea contained 0·23 to 1·52, lamellibranchs 0·31 to 1·56, crustacea 0·05 to 1·39, elasmobranchs none to 0·21, teleosteans none to 6·5, the amounts varying partly with feeding and partly with the season. As to muscles, lamellibranchs contained 0·07 to 2·67 (adductors), crustacea a trace to 0·36, elasmobranchs none to 0·02, teleosteans none to 0·29. The glycogen content of the heart was several times greater than that of other muscles, and sometimes greater than that of the liver—for example, in the lobster. There may be 0·85 to 1·42 per cent. in the heart as against a maximum of 0·36 per cent. in the muscles.—Observations on the Reducing Substance in the Circulating Fluids of Certain Invertebrates and Fishes, by R. S. Lang and J. J. R. Macleod. The body fluid of echinoderms and molluscs contains little or no reducing substance. In some crustacea there is only 0·04 to 0·08, and in certain others only minute traces or none. In the dog-fish none or only a trace was found, while in chimæra and carp the amount was similar to that of mammalian blood (0·071 to 0·145).—Researches on the Perfused Heart: its Mode of Working, by W. Burridge. The experiments were carried out on the hearts of *Rana temporaria* by methods and means already described by the author. The problem hangs round the salts of a special Ringer's solution. A heart so perfused may be likened to a machine working without lubricant, the normal lubricant being adrenin, which facilitates certain actions of calcium. Since blood contains adrenin and Ringer's solution does not the calcium tension of the solution must be higher than that of blood to compensate for the absence of adrenin. The fresh heart perfused with Ringer's solution beats at its maximum amplitude of contraction, but has a low order of "flexibility."—The Effect of Administration of Small Amounts of Thyroid Gland on the

Size and Weight of Certain Organs in the Male White Rat, by James Arthur Hewitt. In adult male rats administration of 0·1 g. or over of fresh thyroid per day causes hypertrophy of heart, liver, spleen, kidneys, suprarenals, and possibly the pituitary. The thyroid is diminished in size. The enlarged organs tend to resume normal proportions after resumption of ordinary diet.—The Influence of the Depressor Nerve on the Pulmonary Circulation, by E. Sharpey Schafer. That the pulmonary system is provided with vaso-motor nerves no longer admits of doubt, but differences of opinion exist as to their action on the circulation. The author's experiments were made on large rabbits anæsthetised with chloroform and under the influence of chloral. Excitation of the central end of the cut depressor nerve in the rabbit—vagi previously cut—produces dilatation not only of the systemic but also of the pulmonary arterioles, the latter effect being usually less pronounced than the former, though occasionally the reverse is observed. The depressor is singularly susceptible to mechanical stimulation, even gentle traction with a thread or the placing of the nerve on electrodes. During the inhibition of the systemic arterioles a large amount of blood is conveyed to the right side of the heart, and the same applies to the pulmonary arteries and the left side of the heart. In animals which, unlike the rabbit, do not possess a separate depressor but have depressor fibres included in the vagus, similar depressor effects are caused by stimulation of the central end of either vagus—both vagi being cut; but the results are apt to be complicated by other effects produced by stimulation of other afferent fibres in the vagus. Conspicuous Traube waves have been found sometimes to follow excitation of the depressor.—The Influence of the Respiratory Movements upon the Blood Pressure in the Pulmonary System, by E. Sharpey Schafer. By a special method described by the author the following, amongst other results, were obtained. Every inspiratory movement is accompanied by a fall of pulmonary blood pressure and every expiratory by a rise. These effects are purely mechanical and are due to increase in calibre of the pulmonary capillaries caused by inspiration and to their diminution by expiration. The changes of pressure in the aortic system caused by the respiratory movements are dependent upon those in the pulmonary system, but bear no constant ratio to them. Most frequently, however, the rise of aortic pressure is synchronous, or nearly so, with the inspiratory fall in pulmonary pressure, and a fall of aortic pressure synchronises with the expiratory rise. In the first stage of asphyxia inspiratory movements were found to increase in force, and expiratory movements to diminish—that is, the pulmonary pressure falls, whilst the aortic rises. In the second stage of accentuated expiratory movements the pulmonary pressure rises.—The other papers in this number are a Survey of Some Elements of Cardiac Excitability, by W. Burridge; Movements of Emotivity in a Japanese Subject, by A. D. Waller; and a Note on Cats with Double Vagotomy, by E. Sharpey Schafer. Two cats with double cervical vagotomy—one lived six months and the other four months, death being due to septic pneumonia, the result of the passage of food or vomit into the air-passages and lungs.

The Psychic Research Quarterly. London: Kegan Paul, Trench, Trübner and Co., Ltd. Vol. I., No. 1. 3*s.* 6*d.* net.—This new publication has been founded to supply the widespread demand for trustworthy information about psychical research, to counteract the inaccuracy and sensationalism of the lay press and the bias of the professedly spiritualistic journals. The first number certainly fulfils the editorial promise to give to its readers "every opportunity of forming their own opinions by publishing the best obtainable contributions to the problem from all sides." The first of these is an article on Scientific Method in Psychical Research, by Dr. F. C. S. Schiller, the well-known Oxford exponent of "Humanism." He points out that every problem of knowing is complicated by the presence of "bias," and that the topics of psychical research are peculiarly fitted to excite undue credulity or incredulity. From the point of view of science the existence of widespread bias hostile to psychical research has been the more important because it has led to the long neglect of this field of inquiry and to the scanty support which has been accorded to the pioneers who have tried to bring the methods of science to the solution of its problems. A plea is put forward for the endowment of psychical research; for here, as elsewhere, the secrets of nature are not to be wrested from her without much ardour and toil. Dr. Schiller believes that the only test that will be universally convincing in psychical research is the pragmatic test. It will be impossible to maintain an attitude of theoretic distrust if the beliefs arrived at can be applied to practical uses in the routine of everyday life. As an example of this he cites a document he once saw which greatly impressed him. It was a form of contract in which a firm of well-sinkers, who employed a "dowser," were prepared to find water in a supernormal manner on the basis of "No water, no pay."—On this topic of water-finding Sir William Barrett contributes a very interesting article, The So-called Divining (or Dowsing) Rod, in which he describes some instances of successful water-finding which might have justified such a contract as that referred to by Dr. Schiller.—The only article which has a clearly spiritistic flavour is one by Mr. J. Arthur Hill on Further Evidence of Supernormal and Possibly Discarnate Agency. He tells how he began his investigations as a sceptic of the school of Haeckel and Huxley, but was forced to become a believer by the accumulation of data of which a spiritistic explanation seemed the only reasonable and logical one. The evidence capable of being presented in a magazine article cannot be expected to convince anyone, but it may serve to direct interested readers to the fuller reports given in Mr. Hill's published works.—Miss Lily Dougall, writing on Faith and Superstition, maintains that science has no test for what may lie behind supernormal experiences, and seems to hold the questionable doctrine that we should attribute no objective reality to any intellectual conception which is out of harmony with our fundamental faith about the universe. She is inclined to believe, as do many of those who take a practical interest in psychical research, that the ultimate value of modern spiritualistic speculation is the extension of human knowledge as regards the powers and capacities of the subconscious, which appear to develop under trance conditions.—Dr. T. W. Mitchell writes on the relations between Psychopathology and Psychic Research. He discusses the nature of the trance-state and the source of the supernormal knowledge which sometimes appears to be manifested therein. He points out that, while we have no experimental parallel for the simple alternating type of double personality, we have in deep hypnosis a close parallel in many respects with the phenomenon of co-conscious personalities. The psychoanalysis of mediums might lead to useful results, but opportunities for such exploration would be very limited. Dr. Mitchell suggests that much popular misconception would be avoided if the distinction between the mechanism and the supernormal content of trance communication were clearly kept in mind, and indicates how psychopathology may throw light at least on the data available for the investigation of psychical research problems.—Mr. C. A. Richardson examines Immortality and the Survival of Bodily Death as Philosophic Problems in the light of the metaphysical hypothesis upheld by him in his recent work, "Spiritual Pluralism and Recent Philosophy." He points out that the problem of immortality is on an entirely different footing from that of the survival of bodily death. The latter can only be settled by a consideration of the empirical evidence, much of which he is disposed to accept. He considers specially important the evidence obtained from automatic script when the medium is not entranced, and thinks it points very markedly in the direction of survival. His reasons for ascribing so much importance to this particular class of evidence are not very cogent.

Tubercle. A Monthly Journal Devoted to all Aspects of Tuberculosis. Vol. I., No. 11. August, 1920.—This number opens with Some Thoughts on the Treatment of Pulmonary Tuberculosis, by Dr. Clive Riviere, who maintains that sanatoriums have not failed, and that the hygienic-dietetic, or rather the rest-and-exercise treatment does, in fact, constitute a cure of proven value. Failure is attributed to delay in diagnosis and defects in after-treatment, not to any inherent fault in the methods of the sanatorium. On the question of the utility of graduated labour, as distinguished from walking exercise, in treating patients who will return to sedentary life Dr. Riviere considers further investigation necessary before a final opinion is formed. A discussion on chemotherapy by metallic agents brings an interesting paper to a close.—The relation of pregnancy to tuberculosis and the indications for abortion form the subject of several book notices and abstracts, while a critical review deals with the incidence of tuberculosis among the first-born and later children. It is concluded that the evidence points to some unknown congenital factor as the cause of the greater susceptibility of the first-born in adult life.—Another interesting review discusses the remarkable difference said to have arisen between the American campaign against tuberculosis and our own, the former being concentrated on improving the soil, while the latter is directed mainly to limiting the spread of the seed. This radical divergence of authoritative opinion should warn us against urging drastic or costly measures until experiment has proved their value on a small scale.

GREAT NORTHERN CENTRAL HOSPITAL EXTENSION.—The designs of Messrs. H. Percy Adams, F.R.I.B.A., and Chas. H. Holden, A.R.I.B.A., have been selected for the proposed extension of the Great Northern Hospital, Holloway.

Reports and Analytical Records

FROM

THE LANCET LABORATORY.

(1) VACCINES; (2) ANTACID LOZENGES; AND (3) FECTO DISINFECTANT.

(PARKE, DAVIS, AND CO., BEAK-STREET, REGENT-STREET, LONDON, W.)

(1) A new series of vaccines introduced by the above firm and prepared under the control of the bacteriological authorities at St. Mary's Hospital calls for notice. First, is a diphtheria bacillus vaccine suggested for the treatment of diphtheria carriers and of convalescents from that disease; secondly, a mixed gonorrhœa vaccine prepared to meet the cases in which secondary infections arise; and, thirdly, an antirheumatic vaccine prepared from numerous strains of streptococci isolated from the mouth, intestinal and genito-urinary tract of patients suffering from rheumatism and rheumatoid arthritis. The suggestion is that such disorders follow streptococcal infections of these channels, and encouraging results are reported from the use of a mixed vaccine.

(2) We have confirmed the formula of these lozenges—bismuth carbonate and magnesium carbonate with essential oils of a well-known carminative kind. The combination is a good one, and the inclusion of taka-diastase, the activity of which in the hydrolysis of starch was shown in our examination, adds to its usefulness in dyspeptic troubles.

(3) Fecto, we find, is a clear, colourless solution of the alkaline hypochlorites, and the specimen submitted showed an available chlorine content of 4·6 per cent. It has a slight chlorinous odour, and its powerful disinfecting properties have been well established. Apart from surgical application, when suitably diluted (1 oz. to the gallon of water) it can be used generally and safely for domestic disinfecting and deodorising purposes.

(1) PERTONAL AND (2) BRUNOL.

(STRANGE AND GRAHAM, LIMITED, 50, CITY-ROAD, LONDON, E.C.)

(1) A contribution from the Pharmacological Laboratory, Cambridge, on pertonal, which is para-acetylamido-ethoxy-benzene, was published in the *Journal of Pharmacology and Experimental Therapeutics* of February, 1919, from which it appears that this substance possesses approximately one-half the toxicity of phenacetin, and as an antipyretic produces similar effects in doses approximately double those of phenacetin. It is reported also that the solubility of pertonal is 1 in 60, whereas that of phenacetin is only 1 in 1700, and while the latter synthetic exerts a directly depressant action on the heart, pertonal exerts a stimulation. According to these results the drug promises to prove a valuable analgesic, but further clinical evidence seems desirable as to its general effects. It is a white crystalline powder and shows a chemical composition related to phenacetin.

(2) Brunol is normal primary butyl salicylate, and the record of its application in the relief of burns is striking from the cases reported from Guy's Hospital. It is a highly refractive fluid immiscible with water, but yielding to that fluid some salicylic acid, as shown by the perchloride of iron test. In burns and scalds it is used as a dressing on lint. Whilst palliative and soothing, it is said to promote granulation and healing.

SEMPROLAX.

(THE WM. BROWNING CO., LTD., ALBERT WORKS, ALBERT-STREET, PARK-STREET, LONDON, N.W.)

The effectiveness of this emulsion is shown by the fact that, according to our examination, only 10 per cent. of the petroleum was directly extracted by petroleum ether. By subsequent chemical dislocation, however, we found present just short of 80 per cent. by volume of paraffinum liquidum of correct viscosity. The emulsion is, in fact, so perfect that it dilutes with water, still keeping its condition of emulsion. There is no separation of the hydrocarbon.

LECTONA.

(LECITHIN, LTD., RICKMANSWORTH-ROAD, WATFORD, HERTS.)

The claim made in regard to this preparation is that it contains lecithins and vitamines, and statements are made referring to the value of these substances. We have established in our analysis the presence of fatty substance which proved to contain phosphorus. It is a malted preparation, and, according to our results, contains 2·91 per cent. of fat. The fat extracted was yellow in colour and appeared to be of an egg origin. The food shows high protein value, equalling 8 per cent. of nitrogen. There are present also sugars derived from malt and milk. There was no starch present according to our examination.

GLAXO, NOS. 1 AND 2.

(GLAXO, 155-157, GREAT PORTLAND-STREET, LONDON, W.)

The introduction of two dried-milk products with an admitted reduction of fatty contents is of interest, inasmuch as some authorities on infant feeding take the view that a high percentage of fat in dried cow's milk causes disassimilation in certain delicate subjects. The samples submitted to us gave the following results: No. 1: fat, 14·40 per cent.; No. 2: fat, 19·60 per cent.—results which conform to the statements of the manufacturers. The reduction of fat in dried milk as here shown no doubt helps in preserving the product against getting rancid, which, it may be added, is a serious trouble with full-cream milk powder. Standard glaxo contains the whole of the cream and keeps well.

SKETOFAX.

(BURROUGHS, WELLCOME, AND CO., SNOW HILL BUILDINGS, LONDON, E.C.)

What is described as a new culicifuge has recently been introduced by the above firm. The preparation is founded on an oily basis resembling vaseline which is practically clear. It is contained conveniently in a collapsible tube. The composition has been well considered, and the essentials making it a sedative and a guard against the attack of malignant insects are of recognised value. It is useful to remember in this connexion that the sting of the wasp is alkaline, whereas that of the bee is acid.

CROFTOL.

(THE UNITED TURKEY RED CO., LTD., 46, WEST GEORGE-STREET, GLASGOW.)

This is a dark-brown, clear, syrupy fluid, containing, according to our analysis, a maximum of tar acids and a minimum of alkali to render them soluble. It mixes well with water, with a slight opalescence resulting. We found present 80 per cent. by volume of tar acids, and alkali equivalent to 4·4 per cent., expressed in terms of Na_2O. In view of the high proportion of tar acids it is not surprising to learn that the germicidal efficiency is high and 11 times that of carbolic acid itself. It shows an alkaline reaction, and when diluted as directed exhibits no corrosive action on the metal of surgical instruments.

SPASMALGIN (ROCHE).

(THE HOFFMANN-LA ROCHE CHEMICAL WORKS, LTD., BASLE; AND 7 AND 8, IDOL-LANE, LONDON, E.C.)

Spasmalgin is described as a combination of papaverine, omnopon, and atrinal, and is supplied in the form of tablets and solution for hypodermic injections, the administration of which, of course, is subject to the control of the physician. The chief claims for its pharmacological uses are that it is a soothing and sedative preparation in gastric pain, colic, and painful menstruation; in a word, an antispasmodic or analgesic. We are not aware that papaverine has been singled out as of special value, but the suggestion is of interest that as an alleviative it is without side-effects, aided by the complete constituents of opium (omnopon). Atrinal, a sulphonic derivative of atropine, is claimed to have a stimulating action on the respiratory centre, increasing not only the number but also the depth of respirations.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 4, 1920.

Modern Applied Physiology.

THE meeting of the British Association for the Advancement of Science at Cardiff last week was an agreed success, not so much in the numbers that attended as in the welcome revival of the opportunity of discussion in congress of scientific progress in many directions. Although regular meetings were suspended through the war period, it is evident from the papers read at the sessions this year that scientific thought was moving all the time even without the stimulating suggestion available at such gatherings. War, in fact, turned a searchlight to bear on many pressing problems, revealing where research was needed before the comfort, convenience, and necessities of human life could be secured in a stable form. We may be excused for seeing the greatest progress along the lines of applied physiology, and in this direction many of the more important addresses pointed. We referred last week to Professor W. A. HERDMAN'S address from the presidential chair, in which he pointed out the advantage to be gained from placing the harvesting of the sea on less empirical lines by studying more closely the habits, movements, diet, and growth of fishes. Professor J. STANLEY GARDINER, in the Botanical Section, touched upon the same subject of human nutrition in relation to the intensive cultivation of food in the land. He showed how capacious is the market for home produce. If only one-fifth of these requirements could be produced at home, this would amount in value to over 20 million pounds, requiring the use of several hundred thousand acres of land and providing employment for 100,000 men.

The address of the President of the Physiological Section also dealt with physiology as applied to large masses of humanity. We print Mr. J. BARCROFT'S study of anoxæmia at the front of THE LANCET this week. Starting from what appears to be only a careful study of the gases of the human blood, particularly with regard to its oxygen content under varying environments, the plot develops from mountain climbing as a hobby to encompass the saving of countless lives risked in gas warfare and the safety and comfort of airmen, military and civilian. The lessons of gas warfare, and the entrancing history of the developments of counter measures are drawn also in an annotation in our present issue dealing with the work of the Royal Army Medical Corps. In the same section Dr. THOMAS LEWIS proposed to bring physiology still more closely home in the medical curriculum by turning the student's observation upon the human organism rather than upon the body of the lower animals. Although it was true that the largest part of our knowledge of human function was still derived by analogy from animal observation, he was concerned rather that students should, in the most impressionable period of their career, learn how to investigate the human body itself. Papers read in other sections bore on this thesis. Professor KARL PEARSON in his Presidential address to the Anthropological Section held that the pulse-tracing, the reaction-time, the mental age of the men under his control were far more important to the commanding officer, and indeed to the employer of labour, than any record of span, of head measurement, or of pigmentation categories. To-day psycho-physical and psycho-physiological characters were of greater weight in the struggle of nations than physique and stature. The experience of the war bore out the need for a new anthropology founded on psychometry. In his address to the Subsection of Psychology on the dreams of children who are physically defective, Dr. C. W. KIMMINS brought out the conclusion that these dreams differ from the normal in several instructive ways which have a practical bearing on educational method.

This is in barest outline the message of the British Association of 1920—a recognition of the application of the principles of physiology to the smallest speck of living matter and to the largest problems of human life. Cardiff itself afforded, however, during the session a curious instance that something still remains to be achieved in the application of orderly scientific method to human requirements. Electric power was there ready harnessed to man's use; all the apparatus of refuse destruction were to hand in working order. But traffic was stationary, and dirt accumulated in the streets from failure of the human element in the machinery. The applied physiology of industry is still in its infancy, and until it is better understood the application of much else will be liable to miss. A successful solution of the problem of industrial fatigue and the adaptation of industry to environment would tend greatly to the advancement of science, and form worthy subjects for the attention of the British Association.

Death Registration.

ALL is not well with the existing arrangements for recording the fact and the cause of death, matters of importance alike from a social and a scientific standpoint. The deputation from the British Medical Association and the Medical Parliamentary Committee, which waited recently[1] upon the Home Secretary and the Minister of Health, laid before them certain recommendations for the amendment of the law in these respects and in the manner of holding coroners' inquests. Other organisations are dissatisfied with the position. At the annual meeting in Birmingham of the Royal Sanitary Institute Alderman J. R. HURRY, honorary secretary to the British Undertakers' Association, commented on the dangerous defect of the present system in regard to the registration of stillborn children. The questions thus raised must be considered in the light of the report published by the Departmental Committee, over which Sir MACKENZIE CHALMERS presided in 1909. Death certification is closely bound up with the coroner's functions, and the two will have to be considered together when Parliament finds the opportunity, long overdue, of dealing with the recommendations of the Departmental Committee and the fresh points which have arisen during the ten years since its Report was issued.

Both the medical deputation and the undertakers' representative emphasise the importance of certain recommendations of the Committee. For example,

[1] THE LANCET, August 14th, p. 375.

a medical practitioner should have to state on his certificate that he has satisfied himself by personal inspection as to the fact of death; again, the absence of a medical certificate should invariably be reported to the coroner. The law as it stands offers every opportunity for premature burial and every facility for the concealment of crime. The case of those who urge amendment could hardly be put more strongly than it is thus put by the Departmental Committee. The deputation, however, breaks new ground in submitting a demand for a dual form of certificate: one part, certifying the fact of death, to be given to the relatives of the deceased, and the other certifying the cause of death, to be handed only to the proper authorities, presumably the Registrar. It is intended that the latter document should be treated confidentially, as the reason given for its use is that under the present system relatives are informed of details which it is not necessary, and at times very inadvisable, for them to know. This, the Home Secretary was informed, leads to the employment by the certifier of euphemisms which deprive the statistical returns of any real value. While the motive of the suggestion is sound enough, the proposal itself amounts to keeping surviving relatives in ignorance of the cause of death as certified. It is hardly likely that the thoughtful part of the public would sanction such an innovation, and we believe that practitioners themselves would sometimes find it prejudicial to their interests. The fact that there existed a secret certificate, possibly varying from the statement made to the family of the deceased, might well tend to diminish confidence and impair friendly relations. Parliament would require strong evidence of the advantages to be gained from this suggestion, and of the weight of medical opinion in its favour, before adopting it. The most drastic proposal of the deputation was to the effect that the coroner's functions as we are familiar with them should be done away with, and his duties restricted to determining the fact and nature of death, leaving the magistrates to carry on the inquiry where it was "proved to be a case for legal intervention." Mr. N. BISHOP HARMAN, the principal spokesman of the deputation, said that the legal side of the coroner's work seemed unnecessary and the publicity of his court undesirable, and Mr. E. B. TURNER, who supported him, referred to the inquest as a pseudo-trial, often conducted without due regard to the laws of evidence.

These are important matters which were not considered by the Departmental Committee of 1909. Probably a second Committee with an enlarged reference might usefully carry on the work of its predecessor as a preliminary to legislation, which should then be introduced without delay. Such a Committee would not necessarily take long to inquire and report, as a great deal of historical matter and questions not needing to be reopened were dealt with by its predecessor. It would have before it the evidence already given for comparison with that advanced in favour of the views of the deputation. It could recall witnesses heard before and ascertain whether they had changed their opinions in the years that have intervened. It could consider afresh questions of fees for medical witnesses and many other matters in the light of present-day conditions. The progress of scientific medicine will be seriously impeded unless these things are cleared up and cleared up promptly.

The Prevention of Tetanus.

THE Research Defence Society has done well in publishing an authoritative pamphlet[1] by Sir DAVID BRUCE on the prophylactic and curative use of antitetanic serum during the late war. The main object of the pamphlet is to place before the public in a clear and convincing manner some facts which may help to discount the machinations of antiscientific fanatics, and in this object Sir DAVID BRUCE will admirably succeed if his pamphlet obtains a wide enough circulation. The sequence of events in the growth of our knowledge concerning tetanus and its culmination in the wholesale use of antitetanic serum during the war, which finally reduced the incidence of tetanus to almost negligible proportions, form a particularly clear-cut demonstration of the value to mankind of the experimental inoculation of animals. Outside the numerically small circle of doctors and nurses few can have seen in his agony a man suffering from tetanus, and Sir DAVID BRUCE rightly insists on the appalling horror of the disease. It is demonstrably fair for defenders of research thus to call true sentiment to their aid.

The facts brought forward by Sir DAVID BRUCE have been published at various times in our columns and in broad outline at all events they are well known to every member of the medical profession. Many of those who served in the R.A.M.C. during the first months of the war had too many opportunities of gaining first-hand knowledge of the disease. Later, when the prophylactic routine for gunshot wounds had been established, these opportunities became rarer, though the slow realisation of the danger of tetanic infection from lesions so trivial as blistered or frozen feet maintained the incidence at a higher level than would otherwise have been the case. Thus there was a considerable recrudescence of the disease in the winter of 1916–1917, when the incidence rose to nearly 3 per 1000 casualties in the home hospitals. In June, 1917, the prophylactic routine was further extended, so that thereafter every casualty received four injections of serum at intervals of a week, and the incidence then never rose again as high as 2 per 1000, not even during the retreat in March, 1918, when external conditions greatly favoured an increase. During the heavy fighting in the last four months of the war the incidence remained below 1 per 1000—a striking contrast to the nine-fold figure registered in September, 1914.

Nevertheless, our memories are short, and it may be doubted whether even the medical profession has fully taken to heart all the lessons learnt during the war. Any prophylactic routine can be enforced with the help of military discipline, but in civilian life there is no such perfect coördination, and it is something of a reproach to medicine that prophylaxis against tetanus has not been more generally applied during the last two years. Tetanus is admittedly not a common disease in civil life, but it continues to occur in spite of our ability to make it almost unknown. Publicity was given recently in the columns of the *Times* to inquests held at Greenwich on one day into two cases which had died from tetanus at

[1] The Prevention of Tetanus during the Great War by the Use of Antitetanic Serum, by Major-General Sir David Bruce, K.C.B. F.R.S., Army Medical Service, Chairman of the War Office Committee for the Study of Tetanus, 1914–1918. London: Geo. Pulman and Sons, Ltd. Pp. 27. 1s.

different hospitals. No reference was made in the report to the use of prophylactic serum, and it is possible that in one case, in which a man had trodden on a nail protruding from a plank of wood, no medical advice was obtained until the symptoms of tetanus appeared. In the other case a boy had severely injured his finger in the iron grating of a street gully, and prophylactic serum should undoubtedly have been given. The preventive routine can and should be enforced by the authorities of every hospital as rigidly as it was in the army, and the attention of the Ministry of Health might be directed to the desirability of securing this. Meanwhile Sir DAVID BRUCE'S excellent pamphlet may serve to emphasise to the public and to the medical profession alike the great importance of efficient prophylaxis. To the latter it may also suggest the necessity for becoming familiar with the principles of the intensive treatment of the disease, when once established, by the intradural injection of the concentrated serum—a method in use during the last year of the war. Sir DAVID BRUCE admits that there has never been any uniformity of treatment; on general principles it is reasonable to suppose that so fatal a disease is best combated by the most drastic remedy.

Annotations.

"Ne quid nimis."

THE PERMANENT INTERNATIONAL HEALTH OFFICE.

WE recently noted with satisfaction the adoption by the Council of the League of Nations, lately held at San Sebastian, of the establishment of a permanent international health bureau as part of the organisation of the League. This will incorporate and supersede the International Office of Public Hygiene in Paris, set up under the Rome Convention of 1907, and usefully active within the limited scope of its constitution. Formal adoption of the enlarged scheme by all the nations in the League cannot take place until November, but there is no reason to doubt that the functions of the Health Office will be extended in the sense of the Council's recommendations. The permanent committee of the Health Office will advise the League in all matters affecting health. It will help to bring administrative health authorities throughout the world into closer relationship, and to secure international agreement on matters of health where common or standardised action by different Governments is needed. It will aim at organising rapid interchange of information in face of epidemics which demand immediate precautions. In dealing with the protection of the worker against sickness, disease, or occupational risk the permanent committee will coöperate with the International Labour Organisation in securing action; doubtless many opportunities will occur of conference and coöperation with the League of Red Cross Societies. One of the most practical functions of the permanent committee will be to organise missions on matters of health at the request of the League of Nations. This is a general outline only of the work of the International Health Office, which will not be limited by any cut-and-dried scheme. Its chief promoters have in view a useful and practical piece of health organisation. One of its first tasks might well be to adopt an international code of disease nomenclature, without which it is difficult for the nations of the world to communicate intelligibly on health affairs. If only international organisations had come into being at a time when Latin was still the medium of civilised intercourse it would have been easier.

GROWTH AND METAMORPHOSIS.

RECENT investigations have shown that not only growth but development and metamorphosis are gradually being brought within our control, and that all three phenomena may be modified in various ways and are probably due to different causes. The marvels of internal secretions and the mysteries of "interstitial glands" are frequently paraded in the lay press, while "growth vitamines" are beginning to be part of every man's general knowledge. There are some recent advances in these matters to which we wish to direct attention, more especially as to endocrine balance and certain special endocrine activities. Animals whose full development implies metamorphosis present problems different from those arising from the regular orderly growth of animals not undergoing metamorphosis. New factors come into play and require study and explanation. If to the ordinary food of frog-tadpoles or other larval amphibians, such as salamanders or the axolott, thyroid extract or thyroid tissue be added, it is known that the duration of the tadpole stage may be greatly shortened, even to one-fourth of the normal period. Frog-tadpoles under appropriate conditions may become frogs in three weeks instead of three or four months. This is not the realisation of an elixir vitæ, but the acceleration of "ageing" as described by Gundernatch in 1912—an "ageing" transformation since confirmed by many observers. The thyroid causes a precocious development of the body, but suppresses further growth. R. K. S. Lim, in a recent paper published in the *Quarterly Journal of Experimental Physiology* (see p. 504 of our present issue), has added to our more intimate knowledge of the histological changes that occur in thyroid-fed tadpoles of the common frog. The number of mitoses in tissues generally and blood cells is increased and the organs become more adult in character. Metamorphosis is accelerated, rapid absorption of the tail muscles occurs, and normal processes are hastened, so that a nine days' tadpole is histologically more adult than a non-treated tadpole of 20 days. Such is the speeding-up or "age-acceleration." The effects of the suppression of thyroid activity in larval amphibians by cauterisation or excision are the converse of those obtained by feeding with thyroid, the tadpoles being prevented from undergoing full metamorphosis. This stage cannot be regarded as an elysium of perpetual youth, for the victims are condemned to live on a lower platform of existence. If thyreoglobulin is hydrolised a mixture of iodised aromatic amino-acids—iodothyrin—is obtained; this has some thyroid-like activities, and so, according to Abderhalden, have artificial iodised proteins, biuret-free products obtained from thyroid substance. All of these possess accelerating action on the metamorphosis of tadpoles; certain iodine-free bodies are said to have such an action. According to Abderhalden, extract of thymus or adult thymus substance prevents metamorphosis but not growth, an action exactly opposite to that of thyroid. We know that the removal of the thymus in mammals arrests growth of the sexual glands, and the bones especially present appearances not unlike those occurring in rickets. E. Uhlenhuth, of the Rockefeller Institute, has carried the matter a stage farther, experimenting on two species of salamanders. According to him, metamorphosis of the larvæ into adult animals takes place only when the thyroid gland begins to excrete the thyroid hormone. Many larvæ with fully developed thyroid glands do not undergo metamorphosis, and since the follicles of their thyroids contain large quantities of "colloid" for a considerable time before metamorphosis, it is probable that the thyroid gland cannot begin to excrete its hormone unless a second factor is present in the larvæ. This factor, it seems, is elaborated during the process of growth, and must be present in a sufficient quantity in order that the thyroid function may begin. The greater the rate of growth the shorter is the length of the larval period. Metamorphosis thus depends not only upon the thyroid hormone, but also on a second substance the quantity of which increases in the same ratio as growth. This second substance must be present

in a certain quantity in order that metamorphosis may take place, and its rate of formation for the same kind of food and for the same rate of growth is distinctly influenced by two factors, the quantity of food and by the temperature. It is quite clear that we are a long way from a satisfactory explanation of the very far-reaching, varied, extensive, and pre-eminent influence of the internal secretion of the thyroid gland on growth development and general metabolism. Nor do we know much of the interdependence of that strange physiological triad—the thyroid, pituitary, and adrenal glands.

DR. COWLEY AND DR. CAWLEY.

SOME medical men are born poets, whereas few established poets are made doctors of medicine. A striking example of the latter select group is to be found in Abraham Cowley (1618–1667), of whose poetry and somewhat wistful charm there is a brief but polished appreciation in the September number of the *XIXth Century and After*, without, however, any suggestion that he belonged to the healing profession. This omission, if such it be, is natural enough, for he was created M.D. at Oxford on Dec. 2nd, 1657, by edict of the Government, in order, so his biographer Sprat considers, to serve as a blind for his real designs—namely, those of a Royalist agent. At any rate, it does not appear that he ever published anything medical, and he certainly should not be confused with Thomas Cawley, often incorrectly quoted in the literature as Cowley, who in 1778 by giving a careful account of a single case earned the credit of the first description of diabetes due to a pancreatic lesion. The case was one of chronic pancreatitis with numerous calculi not larger than a pea. Cowley was a scholar of Trinity College, Cambridge, where, about 1639, among other poems, he wrote an elegy on the death of his intimate friend, William Harvey, who must not be thought to be the discoverer of the circulation (1578–1657). Though if the dates are not kept in mind this error would be excusable, for Cowley was ejected from Cambridge in 1643 and took refuge at Oxford, where he might have come in contact with the King's physician who became Warden of Merton in 1645, and travelled much on behalf of the Royalists. He was also one of the original members of the Royal Society and composed an ode to it. Although, as H. H. Bellot says in the article we have mentioned, "at a precociously early age Cowley fell in love with the delights of simplicity and quiet" he had an unfair share of the alarms and excursions of civil war and of political intrigue. It is satisfactory to learn that he obtained a quiet retreat in the country, though only four years before his premature death, and there composed some essays modelled on Montaigne's. His confession, "I love Littleness in all things—a little convenient Estate, a little chearful House, a little Company, and a very little Feast," may remind the reader of Professor A. E. Boycott's attractively whimsical contribution to the Osler Volume, entitled "On the size of things, or the importance of being rather small."

DEFENCE AGAINST GAS WARFARE.

THE whole question of defence against gas warfare is instructively reviewed in an address by Lieutenant-Colonel P. S. Lelean, published in the June number of the *Journal of the Royal Army Medical Corps*.

It was, he says, on April 23rd, 1915, that London got the news of the first gas attack. The War Office at once made urgent demands on the R.A.M.C. for protection, and that these demands were met was due largely to the high scientific attainments and unfailing resource of Colonel Sir W. Horrocks. The gas first used was chlorine. Its menace was met with pads of cotton waste soaked in glycerine and hyposulphite of soda, sewn into muslin bands. It took time to plan, to obtain and assemble materials for these pads, and to organise their manufacture, but in 60 hours there were 98,000 at the front, in a week 300,000, and in a month 2,000,000. These pads would only neutralise gas for ten minutes, and a man could not work in them for long. The pad was replaced by a helmet made of cotton stuff. It was difficult to get suitable fabric and dyes; eyepieces had to be fitted and carbonate of soda had to be added to the "hypo." to deal with sulphurous acid, yet in three weeks 300,000 were issued, and the work was so well done that the next gas attack, which lasted four hours, did not cost us one life. But more complicated gases came later, and protection against every possible gas had to be provided. The best absorbent for each gas had to be found, and the gas was then tried through an impregnated helmet on a rat. The next experiment was made on a pig wearing a helmet, and if the pig survived one hour the gas was tried on one of the staff, wearing a helmet, in what was called "the lethal chamber." Scientists with dogged courage risked themselves in these dark chambers, became incapacitated, and returned to the adventure as resolute as ever. When the number of gases increased the number of absorbents had to be increased too. Sodium phenate was an effective absorbent for carbonyl chloride and hydrocyanic acid, but the first day helmets were dipped in this solution 200 women had their arms burnt, a horrid shock to the directors. Then it was found that the sodium phenate having absorbed the hydrocyanic acid, the compound became broken up by the carbonic acid of the breath and the rats died; so an exit valve had to be fitted to the helmet through which expired air must escape. Then hexamine (urotropin) was found by a Russian to clear the air of these gases, and for a time a ton a day of urotropin was made for this purpose. These helmets were on issue from July, 1915, to February, 1918, and in all 26,800,000 were made. Effective goggles, too, had to be invented as a defence against lacrymatory gas (benzoyl chloride). Not only men but horses also were protected. Indeed, one pig wore a helmet through a gas attack on Dec. 22nd, and was saved to appear at dinner on Christmas Day as roast pork. The helmets were insufficiently "polyvalent," so were replaced by the box respirator, in whose "tower" were half-a-dozen trays of various absorbents, separated by cellulose diaphragms, and including, in addition to "hypo." and soda, soda lime permanganate to deal with arseniuretted hydrogen (the soda lime permanganate in granules was invented by the late Lieutenant-Colonel E. F. Harrison after 48 inconclusive experiments), sodium sulphite against chlorpicrin, and animal charcoal. The box withstood six gases run through it in succession for one hour each. This respirator, though so complicated, took only 25 seconds to put on, and 16 millions were issued.

This very brief résumé of the address given by Colonel Lelean can hardly do more than call attention to it; those who read the original will be impressed with the urgent gravity of the calls made during the war on our resourceful scientists, and by the tremendous scale of the work that had to be undertaken at a moment's notice. Colonel Lelean remarks that Germany had ever boasted of her "better brains," but once they challenged our scientists squarely and thoroughly woke them up it was our men who won at every turn. He is to be congratulated on his clear and comprehensive account of this scientific victory, for which the army has indeed every reason to be grateful to the Royal Army Medical Corps. We may add that amongst those who with "dogged courage risked themselves in these dark chambers," and who "became incapacitated and returned to the adventure as resolute as ever," was an assistant from THE LANCET Laboratory. On regaining consciousness he said, "This helmet is no good!"

TUBERCULOSIS IN CORSICA.

IN his inaugural thesis Dr. François Serpaggi[1] shows that in spite of the healthy climate tuberculosis is very prevalent in Corsica, perhaps even more so than in many other French departments. He attributes this occurrence to three principal causes—namely, malaria, alcoholism, and consanguineous marriages. The whole of the sea coast, especially on the east, as well as the neighbouring regions up to an altitude of about 300 metres, is infested by malaria. All forms of the disease are met with, benign tertian being the most frequent. The prevalence of malaria is attributed by the writer to the return of numerous soldiers who had contracted the disease in the East. Alcoholism, and especially the consumption of absinthe, is widely spread throughout Corsica, even in the smallest villages. The inhabitants, who were formerly very sober, gave way to alcoholism some time before the war owing to the introduction of cheap alcoholic liquors. It is

[1] Thèses de Paris, 1919–20, No. 181.

therefore not surprising to find that tuberculosis in Corsica, as in Normandy and elsewhere, has gone hand in hand with alcoholism. Dr. Serpaggi states that infection chiefly takes place in the school where there is a complete absence of hygiene and no measures are taken to exclude tuberculous pupils. In some cases families are infected by soldiers who have been discharged from the army for pulmonary tuberculosis. The disease also appears to be spread by milk and butcher's meat, there being no meat inspection in Corsica, except at Ajaccio and Bastia. Lastly, the large number of dark, damp, and generally insanitary houses is an additional cause of the prevalence of tuberculosis in the island.

NATIONAL HEALTH INSURANCE IN SCOTLAND.

THE administration of National Health Insurance in Scotland during the years 1917–19 is dealt with in a White Paper just issued. The report states that the number of Approved Societies for health insurance purposes was 245 in 1919, compared with 312 in 1912. The total number of Scottish cards in August, 1919, was 1,275,029. In an outline of the history of health insurance in Scotland since its commencement in 1912 to the present day, the report acknowledges that when the Act first became operative it was unpopular with both employers and employed. It had been made the occasion of an intensely hostile campaign, which had created an attitude of mistrust, in connexion with which the antagonism of the medical profession was an important consideration. From the outset, however, the general attitude of the Scottish people was one of acceptance. Actual opposition occurred mainly in farming and fishing communities, especially the former. Definite resistance, however, only materialised in certain agricultural counties, in which both employers and employed made common cause. The attitude of the farmers strongly affected that of the tradesmen in the smaller towns and villages dependent upon agriculture. In the Highlands and Islands there was strong dislike for the Act, due largely, no doubt, to the small number of people in these areas employed under contract of service. There was little active resistance, but the definite opposition manifested in other areas continued for years, and was only worn down by great patience and hard work on the part of the Commission's inspectorial staff.

At the outbreak of war the great majority of the difficulties had been overcome, and the Commission had been able to consider seriously the problems of improved services and extension of benefits. Now that the difficulties of the war period have been successfully passed, the value of health insurance to the community can be developed upon a secure basis. The creation of the Scottish Board of Health is a first and necessary step to this end. The Commission hopes that the Board will find in the existing insurance machinery a foundation upon which the future health administration of the nation can be built up and improved. About 95 per cent. of the irregularities disclosed by inspection consist of late stamping of cards, the agricultural community and small employers being the principal offenders. Seven years' experience has shown the original machinery to be remarkably complete, but the insured person is still apt to realise his place in the scheme only when he requires benefit. Some societies interpret their rules in a way which, considering the ignorance of many of their members, can only be described as harsh. The collection of contributions by the stamping of contribution cards has proved satisfactory. The feeling against compulsory insurance has greatly diminished. The desire to remain outside the Act has rather been replaced by a desire to come within its scope and thus profit by its benefits. The only sustained criticisms are as to the sufficiency of the money benefits and the method of raising the funds required. There is little doubt that the money benefits have been very helpful to sick persons, though complaints have been received that in many cases too much of the money has gone to the doctor or the midwife. Medical benefit has been found to work well, even under the restriction of service necessitated by the war, and very little reliable evidence has emerged of neglect of duty on the part of insurance practitioners in support of loose general charges of inefficiency. There is, however, a feeling prevalent that certification of illness has not been performed with equal care by all practitioners. The Commissioners think there is reason for uneasiness, and share the general opinion that medical referees should be appointed to whom claimants could be referred.

With regard to the treatment of cases of tuberculosis, the Commissioners say that under the conditions of war these methods have had no chance of showing what their value really is. The Insurance Act has greatly stimulated the activities of local authorities in dealing with tuberculosis as an infectious disease. Should there come into existence a better organisation of local authorities many difficulties will be removed and the outlook will become more hopeful.

ANIMAL CASUALTIES DURING THE WAR.

THE recent war has demonstrated above all previous ones the economy of an efficient veterinary service for the care of animals both in health and disease, and the value of modern veterinary hygienic and preventive measures. The interesting and hitherto unpublished statistics compiled by the Veterinary Section of the Imperial War Museum (now at the Crystal Palace) show the totals of the British Army animal casualties throughout the war; these work out to less than 15 per cent. per year of the total number of animals on service, and are the lowest figures recorded in any campaign. Actually 484,143 animals lost their lives, including 5589 lost at sea through enemy action, and 22,812 camels (out of a total of 120,013); the percentage of mortality amongst camels was much higher than that amongst horses and mules. The fact that only 1·06 per cent. of the total animals shipped perished on the voyage is a great tribute to the efficient veterinary inspection before shipping and during the voyages, and the hygienic arrangements on board. To the Veterinary Service in particular must credit be given, for only those who have had experience in remount work and the purchasing of large numbers of animals, collected together from all parts of the earth, can know the chaos and risk of working without the skilled veterinary surgeon. Without his aid the most expert layman is soon lost in a tangle with mange, glanders, strangles, contagious pneumonia, epizootic lymphangitis, and a host of other contagious diseases, not to mention defects of wind and locomotion which speedily render the animals valueless for army work. In 1914 the average animal strength was 204,628, with 15·23 per cent. of sick, whilst in 1915, 1916, and 1918 the sick average fell to slightly over 10. Even in that terrible year, 1917, it only rose to 11·44, there being then 966,840 average strength, with 110,632 sick patients. The system of veterinary organisation to keep the animal army fit, and to deal with the sick in such a way that they were not an encumbrance, was well thought out and modelled on lines largely similar to those dealing with sick and wounded men. Veterinary officers at the front were concerned with prevention and first-aid only, the sick being collected in small groups and sent to the mobile veterinary sections, which units forwarded them to the very large hospitals down the line; these latter often contained between 3000 and 4000 patients each. Each sick animal on its way to the base passed through a Reception Hospital, where it was tested with mallein against that scourge of former armies, glanders; it was carefully inspected and treated for mange, ulcerative lymphangitis, influenza, and any other contagious ailment; the badly wounded received urgent aid; severe cases of debility were relegated to special hospitals; and the animals were grouped and arranged in batches according to their ailments. To the student of comparative medicine (and this section will soon include all medical men now that so many diseases have been proved transmissible from animals to man) the Veterinary Section of the Crystal Palace Imperial War Museum will prove of more than

passing interest. It illustrates graphically by means of photographs, models, war relics, and paintings (done by members of the Royal Army Veterinary Corps, amongst whom were voluntarily enlisted some of our best known animal painters) exactly how our sick and wounded animals were cared for on the battlefield and in hospital. Our veterinary colleagues earned well the title of "Royal" Army Veterinary Corps, conferred in recognition of good work. We congratulate them, not only on the title, but on the record of the British Veterinary Service.

BENZYL BENZOATE FOR PERSISTENT HICCOUGH.

SOME years ago Dr. David I. Macht announced the discovery, made in the Pharmacological Laboratory of the Johns Hopkins University, that the benzyl esters, particularly the benzoate, have a remarkable power of allaying spasm in unstriped muscle. In the *Medical Record* of July 24th he has described an important therapeutic application of this fact. He, as well as a number of practitioners who have communicated with him, have found benzyl benzoate of value in the treatment of hiccough—not only the mild forms so common in infants, but those forms which may be termed pernicious, in which the hiccough lasts for days and is unaffected by any kind of medical treatment, internal or external. The following are some examples:—

A man, aged 28 years, complained of persistent hiccough, which had continued for 24 hours in spite of the ordinary treatment. He was given a 20 per cent. solution of benzyl benzoate and ordered to take 25 drops in water every four hours. One dose was sufficient to stop the hiccough.

A man, aged 64 years, came under the observation of Dr. B. Sachs at the Hebrew Hospital, Baltimore, suffering from persistent hiccough of several days' duration which could not be relieved in any way. In the hospital various external applications, such as mustard plasters, were tried without success. Then medicine was given internally, but neither bromides, Hoffman's anodyne, morphine, nor any other drug gave relief. After taking a few doses of benzyl benzoate he was completely cured.

A woman, suffering from post-operative hiccough, was treated ineffectually with all ordinary drugs. The condition lasted over a week and she hiccoughed sometimes as often as 6 to 18 times a minute. Under benzyl benzoate she was relieved within 12 hours.

Dr. Macht also suggests that benzyl benzoate may be of diagnostic value in differentiating hiccough of purely central origin from that of peripheral origin. As the chief effect is on smooth muscle he thinks that the drug will be most useful in hiccough of peripheral origin. He finds that the most convenient method of administration is the one originally described by him. Benzyl benzoate acts best when given in a 20 per cent. solution in alcohol. Of this solution the patient takes 20 to 40 drops in water or milk. Dr. Macht has not found it convenient or advantageous to administer the drug in suspension in elixirs or syrups, and administration in capsules has produced irritation in some cases and rendered the therapeutic action too slow in others. To children the solution can be conveniently administered in sugar, water, or milk.

HOW TO TACKLE NERVE INJURIES.

THE committee appointed by the Medical Research Council to report upon injuries of the nervous system has brought in its findings[1] on the diagnosis and treatment of peripheral nerve injuries, and these will be endorsed by most surgeons who have had experience of such injuries in the great war. Before discussing the indications for and against operative treatment the report describes the various methods of testing nerve function with useful reference to the proper methods, the errors that may be made, and the "trick" movements which may deceive the investigator. Postural and nutritional treatment are then considered in their application to cases under observation in whom operative treatment is contra-indicated. In discussing the technique of operative treatment stress is laid on the necessity of conducting the operation as far as possible in a bloodless field, but exception is taken to the tourniquet on account of the oozing likely to take place afterwards. End-to-end union is insisted on as the only sound method where a portion of nerve trunk is irreparably damaged; flap operations, implantations, and transplantations are all condemned. Surgical opinion in general has been coming round to this view. Under the various nerve headings methods are described whereby such end-to-end anastomosis may be obtained. Fine linen thread or silk is recommended for suture material in anastomosis, less fibroblastic reaction occurring than when catgut is utilised. A useful section is devoted to the signs and symptoms pointing to functional recovery, and some effort has been made to investigate the rate of recovery according to the particular nerve injured. The committee finds that the interval between the wounding and the operation has no influence on the time taken for recovery, a statement of practical value if only by exercising a deterrent influence on hasty surgery. Every case of nerve injury requires careful observation and probationary treatment. Pain, more especially that known as causalgia, receives due consideration, and stress is laid on the psychological factor; the surgeon is not all-important, the patient must assist. Causalgia has been the despair of many a surgeon, but clear indications are given in the report as to when and how he should act, and in what manner he can obtain the coöperation of the patient. Finally, the more important peripheral nerves are considered in turn, indications being given for treatment, and special hints for difficult and complicated cases. The report may be regarded as a valuable addition to our knowledge of nerve surgery, for which the committee deserves our thanks.

[1] Medical Research Council Report No. 54.

"THE HOUSE-FLY AS A DANGER TO HEALTH."

A PAMPHLET by Major E. E. Austen bearing this title is being sent to all medical officers of health, who are invited to purchase further copies (3*d.* each) for local distribution to officials. In a brief explanatory note attached to the pamphlet the Chief Medical Officer to the Ministry of Health points out that the education of the public in the life-history of house-flies and the most effective ways of destroying them forms an important part of the preventive measures required to combat epidemic diarrhœa and other fly-borne infections. The excellent plates forming the frontispiece show the house-fly proper and certain other species more or less harmful with which it is often confused. Certain common errors as to the power of growth and habits of the house-fly are exposed. For example, a small fly in the house is not a young fly in the sense that it will grow larger, since the fly emerges from its pupa-case full grown. Again, those who regard heaps of stale horse-manure as potential breeding places are reassured, and are advised to concentrate on the covering, close-packing, or turning over the surface of dumps of less than 24 hours' standing, since these alone attract ovipositing flies. Turning over the surface checks breeding, because the excessive heat generated by the fermenting manure lower down in the dump kills the eggs. Traps for the slow-moving maggots and methods of destruction of adult flies (which can lay eggs within three weeks after the deposition of the eggs from which they themselves are developed) are described, but it is once again made obvious that the most rational way of dealing with the pest is to attack the breeding places. The pamphlet (No. 1 of a series) is concerned only with the problem of house-flies within the British Isles, but an expanded pamphlet (No. 1A, price 1*s.* 6*d.*), which treats the subject more exhaustively, can also be obtained from the Director, British Museum (Natural History), Cromwell-road, London, S.W. 5, as well as those on lice, fleas, mosquitoes, bed-bugs, and other insects and vermin.

REVERSION OF £13,000 FOR SHEFFIELD HOSPITALS.—Mr. E. Gamble Whiteley, of Sheffield, who died on March 25th, in his will, after making certain provisions for his widow and others, bequeaths the final reversion of his property, valued at £13,000, to the Sheffield Royal Infirmary, Sheffield Royal Hospital, the Jessop Hospital for Women, and the Sheffield Children's Hospital.

A PLEA FOR SIMPLE ANATOMICAL NAMES.

BASED ON THE FREE USE OF THE NATIONAL LANGUAGE.

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I.—*Foreword.*

IN a paper such as this it is useless to weigh the merits, absolute and relative, of the British and the Basle terminologies. Assuming that the British is as unsatisfactory as the supporters of the Basle claim, and that the Basle is as intolerable as those of the British claim, and that the two are as incompatible as everyone claims, let us see what can be done by simplicity and the free use of the national tongue. Such a change would, of course, in no way check the use of Latin by any who might choose it. On the contrary, the simpler the national names the simpler would the international be, and the more direct their appeal.

In the past emphasis has always been laid on the need for an international list in which "Each part shall have only one name" (B.N.A.), and on the need for national description to use only the international names, but if anatomy is ever to become a live subject it will not be by any fetish worship of dead languages but by each man speaking in his own tongue, using Latin and Greek only where his own tongue fails, and even then only in their simplest forms. It is true that for comparison and verification every structure must have an international label, and although the B.N.A. insists that "The terms shall be merely memory signs, and need lay no claim to description or to speculative interpretation," it is, on the contrary, most important that these labels shall be descriptive. Yet it is futile to expect every writer in every land to sacrifice the terms of his just choice to any Procrustean code, least of all to one with so little scientific, linguistic, or literary merit as the B.N.A. The B.N.A. is sublime in that at one stroke it disposed of 25,000 terms; it is ridiculous in that the 5000 which survive were mostly chosen individually by postal ballot.

The great objection against new terms, however good, is the difficulty of changing over. No doubt this is great if the terms are mere labels, but no new term should be adopted unless it is more descriptive than that which it is to displace or else falls more naturally into line with its fellows. The more simple and descriptive the international names, the more easily and naturally will they fit into national description either in their original or in a nationalised or even in a pure national form. Though the simplest name is not always the shortest, it will often be found that in the end the shortest description is that which uses the simplest names.

It cannot be too strongly emphasised that the writer is pleading not for a particular code, nor for particular names, but for the one guiding principle of simplicity based on the free use of the national tongue. In fixing the form of a nomenclature, national or international, it is well to begin with (though not perhaps at first to finish) the names for the body as a whole and for its parts, then to name all the bones, then all the joints and ligaments, and so on. It would be foolish for any one person to formulate a complete list of terms, because unless the foundations were laid in terms acceptable to the whole profession, or at least to all anatomists, the whole superstructure would be worthless.

In this paper, some of the outstanding principles will be stated and their application illustrated by a few examples. It will often be necessary to suggest names without even mentioning the corresponding British and B.N.A. terms. In some ways this will be an advantage as a test.

II.—*The National Language.*

The national language should be freely used. None but a crank would speak of a man's cerebrum as being within his caput, or of respiration being the function of his pulmones, or blood-circulation that of his cor. It is a pity that so few national words have hitherto been used with a precise anatomical meaning. One is never troubled by such words as leg, thigh, arm, neck, and for these one would seldom use the Latin crus, femur, brachium, cervix, although these are familiar through their adjectives crural, femoral, brachial, cervical. It only needs a wider use of home words such as groove, pit, pulley, coil, and many others, for these to become equally familiar in scientific thought. This does not mean that their Latin forms would never be used, but free choice would make description less wooden and more pliable, and the national forms would clarify the student's ideas, and if he knows no Latin and less Greek they would help him to master as much of these languages as is needed. At present he is overcome by the complexity of the human body and the mysterious language in which it is described, whereas if he were trained to think in simple English and easy Latin, he should not find it so hard to master and to remember the facts. Both English and Latin forms are needed, and everyone must be free to choose in every case. If some will insist on using only Latin, and others nothing but English, it will be difficult to get on, but if those who like Latin will temper it with English, and those who prefer English will season it with Latin, everyone may be happy. He is no friend of anatomy, medicine, or surgery, who in these days lays too much stress on his own likes and dislikes.

III.—*The Direct Method.*

Every name should be as direct as possible. This method has been explained by the writer in a paper in THE LANCET of Sept. 8th, 1917, and it will be enough here to give a few examples.

Direct.	*Indirect.*	*Direct.*	*Indirect.*
Stylus.	Processus styloideus.	Cricus.	Cartilago cricoidea.
Corax.	Processus coracoideus	Thyreus.	Cartilago thyreoidea.
Corona.	Processus coronoideus	Quadrigemina.	Corpora quadrigemina.
Sphen.	Os sphenoidale.	Mammillæ.	Corpora mammillaria.
Ethmus.	Os ethmoidale.		
Arytæna.	Cartilago arytænoidea.		

One advantage is the simplicity of the Latin name. Sometimes a simple national equivalent can be used—e.g., crow of the scapula. The adjectives, too, are convenient—e.g., stylar, arytænal, ethmal, and compounds are readily found—e.g., thyreo-arytænal, stylo-hyal

IV.—*The Genitive and Adjective (Latin).*

The genitive should be used for immediate and the adjective for more remote relation. This is well seen in the bones, e.g.:—

Corona ulnæ.	Incisura radii ulnaris.
Stylus radii.	Facetta claviculæ acromialis.
Incisura ulnæ radialis.	Facetta acromii clavia.

V.—*The Use of the Diminutive (Latin).*

Where there are two structures of a kind, one larger than the other, the latter may be distinguished by the diminutive.

Arm-bone—Tuber. Tubercle.	Os brachii—Tuber. Tuberculum.
Sphen—Wing. Winglet.	Sphen—Ala. Alula.
Thigh-bone—Great trochanter. Small trochanter.	Os femoris — Trochanter. Trochantellus.

The single word provides a convenient adjective—e.g., alular. Thus one might say that the sphen had an alular (the optic) and three alar foramina (the round, the oval, and that of the angle, cf. arteria duræ angularis).

VI.—*The Human Body. Corpus Humanum.*

VII.—*Parts of the Body.*

For the main parts of the body, and for their chief subdivisions, national terms should be used, and only where these fail international, e.g.:—

(i.) Head, neck, limbs, chest; face, nose, chin; liver, stomach, brain; shoulder, thumb, fingers, knee.

(ii.) Abdomen, pelvis, perineum.

VIII.—*Position and Direction.*

(i.) *The mid- or median plane.*—Median should be reserved for the mid-plane—that is to say, the antero-posterior vertical plane which bisects the body. There is no median nerve.

(ii.) *Anterior and posterior.*—These can often be replaced by front- and back- (e.g., front-surface or back-surface, or, more simply, front and back of the arm); or, again, by fore- and hind- (e.g., fore-brain, hind-brain)—cf., above, below, upwards, downwards.

(iii.) *Superior and inferior.*

(iv.) *Interior and exterior.*—Interior and exterior express relative distance from the mid-plane. The slight catch here is easily mastered, since the termination is the same as in anterior and posterior, superior and inferior. Moreover, *inner* and *outer* can usually be employed.

(v.) *Internal and external.*—Internal and external express depth within an isolated structure—e.g., external and internal muscular layers of the bowel. Inner and outer can often be used without risk of confusion.

(vi.) *Superficial and deep.*—Superficial and deep should be retained for depth within the body—e.g., the superficial and deep lymph-glands of the groin. At the same time, internal and external and superficial and deep may often be interchanged without confusion.

(vii.) *Lateral.*—Lateral should express symmetrical relation to the body (head, neck, and trunk only). E.g.—Lateral walls of the abdomen, lateral branches of the thoracic nerves. A good example of the use of these and other terms is found in the groin.

IX.—*The Groin in Relation to Hernia.*

(i.) *Herniæ of the abdomen.*—These are umbilical, inguinal (upper and lower), diaphragmatic, and so on.

(ii.) *The groin.*—The groin is the region where abdomen and thigh meet in front, along the line of the limiting tendon, which consists of two parts, the interspinous, swinging between the spines of the iliac and pubic bones, and the lacunar (or gap-tendon), filling in the inner part of the interval bridged by the interspinous tendon.

(iii.) *Canals of the groin.*—These are a lower and an upper.

(iv.) *Lower canal of the groin.*—This leads into the thigh and has a fascial ring and a fatty septum.

(v.) *Upper muscles of the groin.*—These are the superficial, middle, and deep muscles of the lateral wall of the abdomen. Each has a superficial and a deep fascia (in the B.N.A. sense), but the two most important of these are the superficial fascia of the superficial and the deep of the deep muscle.

(*a*) The *superficial* muscle in the groin is inserted into and actually forms the limiting tendon in its whole length, gaining attachment to the iliac and pubic bones through the interspinous and to the pectineal crest through the lacunar portion. It has also a decussate tendon which crosses to the other side.

(*b*) The *middle* muscle in the groin arises from the outer half of the interspinous tendon, and is inserted into the pubic and pectineal crests, mostly in conjunction with the corresponding tendon of the deep muscle, thus forming the conjoined tendon.

(*c*) The *deep* muscle in the groin arises from the outer third of the interspinous tendon, and is inserted by means of the conjoined tendon.

(vi.) *Upper canal of the groin.*—This pierces the three lateral muscles of the abdomen and their fasciæ, and it has three rings, deep, middle, and superficial, from each of which there passes into the scrotum a fascial (or fascio-muscular) sac, the deep sac being derived from the deep fascia, the middle sac from the deep and middle muscles (conjoined tendon), and the superficial sac from the superficial muscle and its superficial fascia.

(vii.) The *peritoneum* in the groin lines the abdominal wall, and has three pits or fossæ, inner, middle, and outer (interior, media, exterior), at the last of which it is evaginated through the upper canal of the groin into the scrotum. The upper part of this evagination becomes obliterated, but the lower persists as a saccule in relation with the testis and its cord.

(viii.) *Descent of the testis.*—The testis leaves the abdomen through the outer pit, descending into the scrotum by way of the upper canal of the groin, at each ring of which it receives a covering. It is therefore covered in by:—

i. Skin. Subcutaneous tissue.
ii. Superficial, middle, deep sacs.

(ix.) *Herniæ of the groin.*—These are lower or upper, according as they pass below or above the limiting tendon.

Lower herniæ pass into the thigh (being usually called femoral).

Upper herniæ make their way towards the scrotum (being often called scrotal), and are outer, middle, or inner, according as they begin opposite the outer, middle, or inner pit of the peritoneum.

An *outer* hernia starts at the outer pit, and, covered by peritoneum and extraperitoneal tissue, it passes through the deep, middle, and superficial rings of the upper canal, appropriating in turn the three sacs which enclose the testis and its cord, and which are themselves covered in by the subcutaneous tissue and skin.

A *middle* hernia starts at the middle pit, and, covered by peritoneum and extraperitoneal tissue, it bursts through and makes a special covering for itself out of the deep fascia, and then it passes through the middle and superficial rings, appropriating the middle and superficial sacs, which are themselves covered in by the subcutaneous tissue and skin.

An *inner* hernia starts at the inner pit, and, covered by peritoneum and extraperitoneal tissue, it bursts first through the deep fascia and then through the conjoined tendon of the deep and middle muscles, and perhaps also the decussed tendon of the opposite superficial muscle, and, having thus made for itself two special coverings, it passes through the superficial ring, appropriating the superficial sac, which is itself covered in by the subcutaneous tissue and skin.

Outer, middle, and inner herniæ might also be called direct, and outer and inner indirect, according to their relation to the upper canal of the groin.

X.—*On Proper Names.*

Proper names should be avoided in writing, although each school may teach the names of those who have done good service to anatomy there or elsewhere.

In the past proper names were recklessly used. Thus, the ileo-cæcal valve was also known as the valve of Bauhinus, the valve of Tulpius, and the valve of Falloppius. Again, although the limiting tendon of the groin was unnamed, its interspinous and lacunar portions were known as Poupart's and Gimbernat's ligaments. The student's chief interest in Poupart is usually whether the name should be pronounced Poopah or Powpart, and he always has an uneasy feeling that something is wrong with Gimbernat, who may after all have been a Frenchman. Again, the mid-brain canal is called the aqueduct of Sylvius. Now, "Who is Sylvia?" is an interesting enough question, but why worry about Sylvius? The writer once heard Sir William Turner explain to his class that Sylvius was an Englishman named Wood, and that fissura Sylvii was adopted for Wood's fissure because it sounded and looked so much better than fissura Woodi. Perhaps, however, Sir William was only making merry. Be that as it may, an anatomical lecturer much more learned in such things than the writer recently claimed that Sylvius was one or other of two Frenchmen (he did not know which), whose names were Le Bois and Du Bois, or the like. Lastly, a physician was recently pleading for keeping this name "out of reverence for the master who taught in Florence." "Padua," said the writer at a venture. "Padua, to be sure," replied the physician unabashed.

And so the smoking torch of knowledge is handed on, each receiving it reverently, and reverently passing it on without troubling to see whether within the smoke there is or ever has been any light.

XI.—*The Bones.*

Every bone should be named after the region or part of the body to which it belongs, and where such region or part contains more than one bone these should be distinguished by some feature, actual or fanciful. It is more important that names derived from such features should be short and simple than that they should be specially appropriate.

Thigh—Thigh-bone.	Femur—Os femoris.
Arm—Arm-bone.	Brachium—Os brachii.
Leg — Leg-bones: Flute-bone, brooch-bone.	Crus—Ossa cruris: Tibia, fibula.
Wrist — Wrist-bones: Skiff-bone, moon-bone, wedge-bone, pea-bone, saddle-bone, boot-bone, great bone (of the wrist), hook-bone.	Carpus—Ossa carpi: Scaphus, luna, cuneus, pisum, sella, cothurnus, magnum, uncus.
Brow—Brow-bone.	Frons—Os frontis.
Temple—Temple-bone.	Tempus—Os temporis.
Nose—Nose-bone.	Nasus—Os nasi.
Cheek—Cheek-bone.	Mala—Os malæ.
Palate—Palate-bone.	Palatum—Os palati.
Flank—Flank-bone.	Ilium—Os ilii.
Lower limb — Girdle-bone: Flank-bone, bone of the pubes, sciatic bone.	Membrum inferius — Os cinguli: Os ilii, os pubis, os sciaticum.

Notes.—(1) Humerus is not needed for the arm-bone and badly needed for the shoulder, which has at present no international name. The B.N.A. articulatio humeri begs the question. (2) Those who stickle for linguistic accuracy and object to os temporis, os ilii, should bear in mind that ilium is a genitive plural, pubis a genitive singular, and ischium the name of a region. Nomenclature should be the handmaid and not the mistress of science.

XII.—*Parts of the Bones.*

(i.) The parts of a bone should be named intrinsically, each part having a name indicating its character (actual or fanciful) and its relation to the bone itself without reference to any other part of the body.

Radius—Style.	Radius—Stylus.
Ulna—Crown.	Ulna—Corona.
Scapule—Crow.	Scapula—Corax.

(ii.) Where this is not satisfactory an extrinsic term may be employed, the part of the bone being distinguished by its relation to some structure or part of the body other than the bone itself.

(*a*) A trial may be made with a local term, the part of the bone being named after its relation to some neighbouring structure or part.

Thigh-bone—Patellar surface.	Os femoris—Facies patellaris.
Ulna—Radial notch.	Ulna—Incisura radialis.
Scapule—Vertebral border.	Scapula—Margo vertebralis.

(*b*) A general term may have to be tried, the part of the bone being named according to its position in the body.

Limbs—Upper, lower.	Membra—Superius, inferius.
Scapule—Angles: Upper, lower.	Scapula — Anguli: Superior, inferior.

(*c*) It may be necessary to appeal to comparative anatomy for a term, especially in relation to development. All such terms should be avoided as much as possible. It is almost beyond belief that anyone should wish to change upper and lower for cephalic and caudal. "We're not as tabbies are," and there is no reason why human anatomy should continue on its belly with its tail sticking out behind it, when the being whom it is supposed to describe has long since got his back up, doffed his tail, and walked upright.

(*d*) If all the above fail, some adventitious name may be chosen, perhaps to the glory of some investigator. Proper names should, however, only be adopted if no others can be found satisfactory.

The intrinsic and extrinsic methods should preferably be employed in the order given above and they may be applied to the scapule. This is a flat triangular bone with two surfaces, three angles, and three sides or borders. It is natural therefore to look for an apex and a base, and these are best found in the outer angle and the posterior or vertebral border, and the two other angles thus become the basal angles. Since the intrinsic method will yield no more the remaining sides may be distinguished by local extrinsic terms as the cervical and axillary borders, and similarly these are costal and dorsal surfaces, dorsal being here used with a local rather than a general significance. The remaining angles would be distinguished by more general epithets as the upper and lower basal.

This method, which is by no means essential, might avoid considerable discussion and the international terms, though labels,

would be descriptive. But these terms would not need to be slavishly followed, and it would be open to anyone to speak of the vertebral border, or the outer angle, or the deep surface, provided always that the context was so plain that no confusion could arise. Wherever there was any risk the international terms should be used in either the Latin or an Anglicised form. As national equivalents the writer prefers for general use superficial and deep surface, outer, and upper and lower (basal) angles, and posterior, upper and outer borders, as well as the alternatives apex and base. The last is very convenient in dealing with the muscles. Also, super- and sub- have their place—e.g., superscapular muscles.

The arm-bone has many parts which can be named intrinsically, although extrinsic expletives can always be added. There are times when the student may like to pick up a bone and study it by itself, without for the moment troubling about its relations to any structure except the other parts of the skeleton. Thus one might take a rapid survey of the head, anatomical neck, tuber and tubercle with the straight groove (with its floor and inner and outer crests), surgical neck, shaft, spiral groove, eminence, line, outer and inner borders, anterior surface (with inner and outer areas), posterior surface, radial and ulnar (both coronal and olecranal) pits, little head, pulley, and inner and outer nodes (the former with its groove).

A word about condyle. It is curious that the metacarples should in these days have heads instead of condyles, although their head-ends form the condyles (κόνδυλοι) or knuckles from which the term is derived. What in these days is a condyle? And what an epicondyle? While the metacarples have neither condyles nor epicondyles, the tibia and occipital bone have condyles but no epicondyles, the arm-bone has epicondyles but no condyles, and the femur has both condyles and epicondyles. A condyle may be a more or less definite knuckle with a convex facet as in the femur, or, again, an ill-defined mass with the concave facet into which that knuckle fits as in the tibia. Why not, then, use condyle for any knuckle of bone with a facet? The condyle of the mandible is described as including the neck as well as the head with its facet. Why not let the arm-bone have its upper condyle or knuckle with the head, anatomical neck, tuber and tubercle, and its lower condyle or knuckle with the little head, pulley, and inner and outer nodes? The epicondyles would then vanish into the limbo whence they came. The lower condyle of the femur would in this way consist of inner and outer condyles with the intercondylar notch.

XIII.—*The Joints and Ligaments.*

A. *The Joints.*

Every joint should be named after the bones which it articulates, and should be regarded as provided by one bone which is fixed for the benefit of another which is movable.

The movable bones may be regarded as articulated in succession. The nucleus of the system is the sacrum, which provides for the movement of (i.) the coccyx, (ii.) each vertebra in succession up to the axis, which in turn provides for the atlas, and this again for the skull, on which finally the lower jaw moves. The vertebræ provide for the ribs, and these again for the sternum. For the upper limb the clavicle is articulated with the sternum, the scapule with the clavicle, the arm-bone with the scapule, the bones of the forearm with the arm-bone, the radius also with the ulna, the first row of wrist-bones with the bones of the forearm (though separated from the ulna by the triangular septal cartilage), and so on. In the wrist the individual bones are articulated in succession from without inwards—e.g., the scaphus takes on the lune, the lune takes on the cuneus, and the cuneus takes on the pisum, and so with the second row. So also throughout the lower limb.

The practical result of the succession of the bones is that in the international list most of the joints can be named after the bones which form them. In national description the joint of the clavicle with the sternum may, according to the context and the preference of the individual writer, be named in any of four ways—namely, sternoclavian joint, clavisternal joint, sternal joint of the clavicle, clavian joint of the sternum. For the international list one only of these forms can be admitted and here the rule of succession comes into play, so that this joint would be either the sternoclavian joint or the sternal joint of the clavicle. Although in its full form the latter is the longer, it is to be preferred, because in practice it is really simpler and can often without confusion be reduced to the sternal joint of the clavicle or even the clavicular joint. Thus, in describing the sternum one may speak of its clavicular and costal joints, whereas in describing the clavicle one may equally well speak of its sternal and scapular (or acromial) joints. Moreover, one can use this form for making the name more detailed and precise as the sternocostal joint of the clavicle.

The rule of succession would be of value chiefly in determining the form of the international terms. The scapular joint of the arm-bone would, of course, usually be spoken of in Britain as the shoulder-joint. On the other hand, the elbow-joint is so complex that it would appear as such in the international list also.

On this principle one might enumerate those joints of the upper limb which have a complete capsule as follows:—

Sternocostal joint of the clavicle.	A. claviculæ sternalis.
Clavicular joint of the scapule.	A. scapulæ clavicularis.
Scapular joint of the arm-bone.	A. (ossis) brachii scapularis.
Elbow-joint.	A. cubiti.
Wrist-joint.	A. carpi.
Cuneal joint of the pisum.	A. pisi cunealis.
Complex joint of the table of the hand.	A. manus tabulæ complex.
Sellar joint of the thumb metacarple.	A. pollicis metacarpuli sellaris.
Interphalangeal joints.	Aa. interphalangeales.

Once the rule of succession had become familiar the international terms could be reduced to A. claviculæ, A. scapulæ, A. brachii, A. cubiti, A. carpi, A. pisi, A. manus complex, A. pollicis metacarpuli, A. phalangis secundæ, A. phalangis tertiæ. The various British equivalents which might be substituted for the above are too obvious to be given here.

The same method may be applied to the part-joints—e.g., the elbow-joint may be tabulated as follows:—

Elbow-joint.
- (i.) Brachial joint of the forearm. Brachial joint of the ulna. Brachial joint of the radius.
- (ii.) Upper joint of pronation.
  - (Brachial joint of the radius.) Upper ulnar joint of the radius.

The wrist-joint to be in harmony with the other septate joints should include the lower joint of pronation and the radio-septal joint of the wrist.

Other examples of succession in their short form are A. pisi, A. cubi, A. mandibulæ, A. phalangis primæ pollicis.

B. *Classification of the Joints.*

Whatever nomenclaturists devised the names for the various types of joints must have wallowed in Greek—of a kind. Symphysis, arthrodia, ginglymus, gomphosis, synchondrosis, synarthrosis, enarthrosis, diarthrosis, amphiarthrosis, syndes—Moses! What a list for a student who knows no Latin and less Greek.

(i.) *Movable and immovable joints.*—Each joint may be regarded as provided by a bone which is fixed for another which may or may not be movable, the ligaments and muscles being regarded as arising from the former bone for retaining or moving the latter.

(ii.) *Continuous, partly continuous, and discontinuous joints.*—The continuous are immobile, whereas the partly continuous and discontinuous are mobile.

(iii.) *Continuous joints.*—These may be distinguished by the character of the uniting tissue, as membranous, cartilaginous, and ossified, and the membranous, which may retain the name of sutures, may be distinguished according to the form of the articulating surfaces—e.g., linear, plane, serrate, sulcal, alveolar, squamous.

(iv.) *Partly continuous joints.*—Such are the intercentral joints of the vertebræ. Singly these present little movement, but from the point of terminology we may glance at the movements which might take place between any two discs separated by a firm but elastic medium.

- (*a*) *Rotation.*—The moving disc may rotate on the fixed disc around its own axis which may be regarded as perpendicular.
- (*b*) *Lapse.*—The moving disc may slip bodily on the fixed disc, in which case its axis remains perpendicular but is shifted out of place.
- (*c*) *Flexion.*—The moving disc may be tilted, in which case its axis leans over to one or other side.
- (*d*) *Approximation and separation.*—The moving disc may approach or go away from the fixed disc.
- (*e*) *Mixed movements.*—Thus, theoretically, all these movements might take place at once.

(v.) *Discontinuous joints* are either (*a*) ligamentous (e.g., lower tibial or fibular), or (*b*) capsular, the former giving slight lapse only, the latter giving varying degrees of rotation, lapse, and flexion, but of course, no approximation or separation.

Capsular joints may best be distinguished according to the nature of the facet provided by the fixed bone—e.g., plane, concave, convex, and so on.

- (*a*) *Plane joints*—e.g., cuneal of the pisum.
- (*b*) *Concave joints.*—Uniconcave or notch-joints (incisural)—e.g., upper ulnar of radius. Biconcave or boat-joints (navicular)—e.g., radio-septal of wrist. Universal concave or cup-joints (pocular). These are shallow cup- or glenal as at the shoulder, and deep cup- or cotylar as at the hip.
- (*c*) *Convex joints.*—Uniconvex or wheel-joints (rotal)—e.g., lower ulnar of radius. Biconvex joints (antinavicular?)—e.g., astragalar of scaphus, which is almost a ball-joint. Universal convex or ball-joints (global)—e.g., brachial of radius.

Or the facet may be a modification or combination of the above, e.g.:—

Irregular joints—e.g., between some of the wrist-bones.
Concavo-convex joints—e.g., joint of the second row of carples.
Saddle-joints (sellar)—e.g., joint of the thumb metacarple.
Pulley-joints (trochlear)—e.g., brachial of the ulna.
Antitrochlear joints—e.g., part of the ankle-joint.

Capsular joints may also be classified according to the nature of the movements which actually take place in the moving bone, e.g.:—

Labile—e.g., femoral of patella.
Flexile.—Uniflexile or hinge- (cardinal)—e.g., elbow. Biflexile—e.g., radio-septal of wrist. Universal flexile—e.g., shoulder-, hip-.

Capsular joints may also be: *Septate*, having a septal cartilage—e.g., temporal of mandible. *Compound*, being formed by more than two bones—e.g., knee-, elbow-, astragalar of heel-bone and scaphus.

In compound joints one may need to study: (*a*) the form of each facet, simple and compound. (*b*) The movements which each facet should allow. (*c*) The limitations imposed by ligaments and neighbouring structures. (*d*) The movements which actually take place at each facet. (*e*) The movements which actually result in the part—e.g., thigh, hand.

Capsular joints show only rotation, lapse, or flexion, or combinations of these, and flexion may be further defined according to the direction—e.g., forward, backward, inward, outward, upward, downward, or by the special terms flexion, extension, adduction, abduction, levation, and depression.

C. *The Ligaments.*

The ligaments of the capsular joints are: (i.) the capsule, parts of which may form capsular ligaments; (ii.) accessory ligaments.

(i.) Capsular ligaments may be briefly named after the joint—e.g., anterior, posterior, inner, and outer of elbow-joint, or more strictly of the brachial joint of the forearm. Sometimes a bony relation will be mentioned—e.g., upper, middle, and lower glenal of the shoulder-joint, or iliac, pubic, or sciatic of the hip-joint, or, again, the collar ligaments of the radius and thigh-bone.

(ii.) Accessory ligaments will mostly be named after bony attachments—e.g., costal of the clavicle, clavian of the crow, fibular of the tarsus (or outer of the ankle), the last consisting of the anterior and posterior fibular of the astragalus and the fibular of the heel-bone.

Ligaments which join two parts of the same bone may be named in two ways—e.g., (1) coraco-acromial, (2) ligament of the notch of the hip-cup or acetabulum, according as the two parts have special names or not.

XIV.—*Muscles.*

Every muscle should be named after its origin and insertion, and where necessary or convenient the name should indicate not merely the bones concerned but the actual parts to which the muscles are attached.

Had we been living in the days when Latin was the language of science this problem would have presented little difficulty. An eminent anatomist has recently pleaded for a nomenclature based on an exhaustive study of many different languages. Such a hope is futile. It is difficult to find five men interested in their own national terminology, and how shall we find even one interested in ten? Fortunately, the names are to be found by the study not of many national nomenclatures but of the body itself. In the case of the muscles, the aim should be either brevity with all possible description or description with all possible brevity. The writer prefers the latter.

One of the best examples for illustrating the method is the latissimus dorsi (Br., B.N.A.) because of its complex origin and well-defined insertion. The insertion would be arrived at by what might be called the step-method.

				Arm.
			Bone of	Arm.
		Straight groove of	Bone of	Arm.
	Floor of	Straight groove of	Bone of	Arm.
Muscle of	Floor of	Straight groove of	Bone of	Arm.
Nerve of Muscle of	Floor of	Straight groove of	Bone of	Arm.
				Brachium.
			Os	Brachii.
		Sulcus rectus	Ossis	Brachii.
	Fundus	Sulci recti	Ossis	Brachii.
Musculus	Fundi	Sulci recti	Ossis	Brachii.
Nervus Musculi	Fundi	Sulci recti	Ossis	Brachii.

To the genitive of the insertion would be added the adjective of the origin. This muscle would therefore become the iliospinal, costal and scapular muscle of the floor of the straight groove of the arm-bone, M. iliospinalis et costalis et scapularis fundi sulci recti ossis brachii, and it might well adopt for its motto, "Nemo me impune lacessit." After all, however, the costal and scapular origins are subordinate, and since the student is not likely to be misled into wondering whether the muscle acts upon the fundus of the stomach or bladder or even on that of the eye, it will be enough to speak of the iliospinal of the floor, iliospinalis fundi, and on occasion the name may be even further shortened, so that, e.g., the muscles of the posterior wall of the axilla might be enumerated as the subscapular, the iliospinal and the angular (subscapularis tuberculi, iliospinalis fundi, angularis cristæ interioris). We should also have the nerve to the iliospinalis fundi.

Other Examples.

(1) The muscles inserted into the mastoid (?) are the sterno-clavian, the spinal, and the alo-articular. (N.B. Ala = processus transversus.)

(2) The scalene (?) group consist of the anterior and posterior scalenes of the first rib and the scalene of the second rib.

(3) The muscles attached to both bones of the shoulder girdle are the occipitospinalis of the girdle and the cingularis of the arm.

(4) The pectoral muscles are the pectoral of the clavicle, pectoral of the scapule, and pectoral of the arm, or in greater detail, the pectoral or costal of the groove of the clavicle, pectoral or costal of the crow of the scapule, pectoral or sterno-costo-clavian of the outer crest of the straight groove of the arm-bone.

(5) The muscles inserted into the scapule only are the alar, the upper and lower spinal, the costal of the base, and the pectoral or costal of the crow.

(6) The deltoid and coraco-brachialis (e.g.) and their bony attachments become the cingularis of the eminence and the eminence of the cingularis, the coracalis of the line and the line of the coracalis.

(7) In the outer column of the erector of the back the three muscles become the iliac of the angles, the interangular, and the angular of the alæ (ala = processus transversus, chiefly because short and simple).

(8) The muscles inserted into the arm-bone are the supraspinate, infraspinate, and marginal of the tuber, the subscapular of the tubercle, the iliospinal of the floor of the straight groove, the angular of its inner and the pectoral of its outer crest, the cingular of the eminence, and the coracal of the line.

(9) The muscles of the lateral wall of the abdomen are the superficial, middle, and deep (here the bony attachments are too complex).

(10) Arising from the style of the temple-bone are the stylar muscles of the tongue, of the pharynx, and of the U-bone (or hyal bone).

(11) The extrinsic muscles of the tongue are the stylar, the hyal, and the palatine of the tongue and the submental of the tongue and U-bone.

(12) The muscles of the mouth are i., the annular or ring-muscle and the buccinator or trumpeter; ii., (*a*) the mandibular of the lower lip; (*b*) the mandibular, risorius, malar, and canine of the angle; (*c*) the malar, infraorbital, and angular of the upper lip, with which last is associated the angular of the ala of the nose.

(13) The constrictors of the pharynx are the upper or pterygo-mandibular, the middle or hyal, and the lower or thyreo-crical.

(14) Iliocentral of the trochantellus.
Iliac of the trochantellus.
Central of the trochantellus.
Superthyral of the pit of the trochanter.
Subthyral of the summit of the trochanter.
Calcaneal extensor.
Biceps of the tubercle of the radius.
Triceps of the heel.
Biceps pronator.
Prænodal } heads.
Coronal }
Prænodal of the index metacarple.
Prænodal of the palmar fascia.
Prænodo-ulnar of the pisum.
Triceps of the second phalanges.
Radial of the third phalanges.
Tibial flexor of the toes.
Fibular flexor of the great toe.
Sphenopterygal of the neck of the mandible.
Pterygo-maxillary of the angle of the mandible.
Tubosphenal tensor of the palate.
Tubopetrous levator of the palate.

Everything depends on how the international terms are to be used. If national description is slavishly to employ only the international terms it will remain for ever wooden, dry, and dead; but if it be allowed the simplicity and fluency of the national tongue it will live during the period of study and survive in the memory. Most of the muscles are sufficiently defined by short names, the word muscle being avoided by the Latin form—e.g., occipitospinalis, cingularis, alaris scapulæ, extensor calcaneus, tubosphenalis, subthyralis, gemellus spinosus, musculus pisi, brachialis coronæ, coracalis, flexor secundarum. The thyral muscles are the subthyral culminis trochantri and the superthyralis fossæ trochantri, but these are sufficiently defined as the subthyralis culminis and the superthyralis fossæ, or even as the sub- and super-thyralis. They may be grouped together as the thyrales.

In many cases classification will do away with undue formality—e.g., the prænodalis indicis metacarpuli, prænodalis palmæ fasciæ, and prænodo-ulnaris pisi—may well be classed in national description as the outer, middle, and inner flexors of the wrist. So, too, the pectorals may be distinguished as the great, the middle, and the small—cf., glutei.

XV.—*Nerves.*

Everything being so contingent it is not proposed to deal here in great detail with the nerves.

(i.) A nerve shall retain or suggest its name from beginning to end.

The trigeminus splits into three parts—the first, frontal or supraorbital geminus; the second, maxillary or infraorbital geminus; and the third, mandibular or mental geminus.

Trigeminus.	N. trigeminus.
First geminus.	N. geminus primus.
Branches: Lacrimal.	Rami: Lacrimalis.
Nasal.	Nasalis.
Supratrochlear.	Supertrochlearis.
Second geminus.	N. geminus secundus.
Third geminus.	N. geminus tertius.

(ii.) A motor nerve shall be named after the muscle or muscles which it supplies, and if that is not satisfactory after a bone or other structure with which it comes into relation.

One would thus have the nerve to the cingularis, nerves to the alaris of the scapule, nerve to the spinales of the scapule, nerve to the spinati, nerve to the coracalis, nerve to the costalis of the base of the scapula, nerve to the clavicular pectoral, nerves to the temporalis, nerves to the pterygo-maxillaris, nerve to the stylaris of the pharynx, nerve to the thyrealis crici.

(iii.) A mixed nerve shall be regarded as a motor nerve giving off sensory branches.

Thus the ulnar nerve has muscular branches and ends in muscles, and it also gives off cutaneous branches—namely, one to the back of the hand, one to the palm of the table of the hand, and several to the palm of the fingers, or, in other words, a dorsal manual, a palmar tabular, and several palmar digital cutaneous branches; or, again in other words, the ulnar dorsal manual, ulnar palmar tabular, and ulnar palmar digital cutaneous nerves.

Again, the spiral nerve (Br., musculo-spiral; B.N.A., radial) ends on the back of the hand, giving off cutaneous branches—namely, two to the arm, one to the forearm, and one to the hand; or, in other words, two brachial, an antibrachial, and a manual cutaneous branch; or, again in other words, the spiral cutaneous nerves of the arm, forearm, and hand.

From this point of view it is well to make the nerves as long as possible—e.g., to carry back the ulnar nerve right up to the spinal cord, in which case it would arise by two roots, and then proceed successively through the neck, axilla, arm, forearm, and hand, giving off, among others, a pectoral muscular branch, and brachial and antibrachial cutaneous branches; or, in other words, the ulnar pectoral nerve, and the ulnar cutaneous nerves of the arm and forearm. This can be done with the other great nerves derived from the brachial plexus.

The international terms may be chosen by a method which will be illustrated in the case of the arteries. Some will be named as branches of the parent trunk, others as nerves supplying certain structures.

XVI.—*Arteries.*

The principles governing the naming of the arteries somewhat resemble those for the nerves. Thus the arteries should be given names which will extend over as long a stretch as possible—e.g., the left brachial artery begins at the aorta and is distributed to the whole limb. At the same time its main divisions and branches may for convenience be called by separate names.

The heart gives off the systemic artery (= aorta) and the pulmonic artery.

The aorta gives off the arteries of the heart (= Aa. cordis), the cervico-brachial and the left cervical and left brachial arteries. The left brachial has a thoracic, a subclavian, an axillary and a brachial (proper) part (e.g., = subclavian artery, axillary artery), and it then divides into radial and ulnar parts (= radial and ulnar arteries), which again divide into superficial and deep vessels, which finally stomatose to form the corresponding arches of the palm.

The left cervical artery ascends through the thorax and neck and divides into the temporo-facial and the petrous artery of the brain (cf. vertebral artery of the brain).

The temporo-facial divides into a temporal, and two facial parts (= A. temporis, A. faciei superficialis, and A. faciei profunda), and it has certain other branches—namely, thyreal (= A. glandulæ thyrealis superior), lingual (= A. linguæ), post-auricular (= A. post-auricularis), and occipital (= A. occipitis).

The petrous artery of the brain divides into cerebral branches (= A. cerebri anterior, A. cerebri media).

The cervico-brachial (= A. cervicis et brachii, which is more convenient than A. capitis et membri superioris) divides into the right cervical and right brachial, which resemble the left except that they have no thoracic part.

And so on.

The method is well seen in the axillary artery, the branches of which go (*a*) to the inner, (*b*) to the anterior, (*c*) to the posterior, and (*d*) to the outer wall of the axilla.

Cervico-brachial artery = A. cervicis et brachii.

Brachial artery = A. brachii.

Axillary part = Axillary artery = A. axillæ.

Thoracic branch = Axillary thoracic artery = A. thoracis axillaris.

Pectoral branches

= Pectoral arteries	= Aa. pectoris.
Upper.	Superior.
Lower.	Inferior.

Scapular branch = Outer scapular artery = A. scapularis exterior.

Brachial branches

= Brachial circumflex arteries	= Aa. brachii circumflexæ.
Anterior.	Anterior.
Posterior.	Posterior.

The systemic artery or aorta divides into the pelvi-femoral arteries, each of which again divides into the pelvic and femoral arteries, the latter having an iliac portion (= iliac artery = A. ilii), an anterior femoral portion (= A. femoris anterior) and a popliteal portion (= A. poplitis), which last divides into the anterior and posterior arteries of the leg (Aa. cruris anterior, posterior), which latter gives off the fibular artery (= A. cruris fibularis), and ultimately divides into the inner and outer arteries of the sole (= Aa. plantæ interior, exterior).

Enough.

Whatever system is adopted, there must be plenty give and take, and probably for everyone more giving than taking.

XVII.—*Correlation.*

Some examples of correlation may be given.

(i.) Pectoral region.—Pectoral fascia; Pectoral membrane

Pectoral muscles—Of the arm = great pectoral. Of the scapule = middle pectoral. Of the clavicle = small pectoral.

Pectoral nerves: Radial pectoral—Upper = Nerve to the small pectoral. Lower = Nerve to the great and middle pectorals. Ulnar pectoral = Nerve to the middle pectoral.

Pectoral arteries: Upper; Lower.

Pectoral cutaneous branches of the cervical nerves: Inner; Outer. (Cf. also humeral cutaneous branches.)

(ii.) Thyra (i.e., door) of the pelvis.—Thyral groove. Thyral tubercles. Thyral membrane. Thyral muscles; Superthyral. Subthyral. Thyral nerve. Thyral artery.

(iii.) Occipital bone.—Jugular foramen. Jugular sinus. Jugular vein. Jugular nerve of the pharynx. Wandering jugular nerve. Jugular nerve of the girdle.

(iv.) Scapular stomatosis.—The scapular arteries—posterior, upper, and outer—stomatose freely in the subscapular fossa, at the base and beside the upper and lower basal angles, and in the superscapular fossæ (supra- and infra-spinate). The posterior is found in all these places, the upper fails only at the lower angle, while the outer fails above the spine—that is to say, in the supraspinate fossa and at the upper angle.

(v.) The heart.—Trabecular, pectinate, moderator, papillary muscles.

(vi.) Branches of the aorta to the alimentary canal in abdomen.—First, second, third enteric arteries.

(vii.) The primitive enteron becomes moored to the posterior abdominal wall by the common mesentery and each of the organs into which the tube becomes differentiated has a corresponding part of the common as its own special mesentery—e.g., gastric, duodenal, jejuno-ileal, and colic mesenteries. The splenic portion of the gastric mesentery at one time consists of the parietal ligament of the spleen and the splenic ligament of the stomach. Later it is represented by the renal ligament of the stomach, which consists of the renal ligament of the spleen and the splenic ligament of the stomach. So, too, the pancreatic portion of the gastric mesentery at one time consists of the parietal ligament of the pancreas and the pancreatic ligament of the stomach. Later the pancreas loses most of its parietal ligament and becomes fixed to the wall, and the pancreatic ligament of the stomach is divided by the transverse colon into the pancreatic ligament of the colon (also called the secondary mesentery of the transverse colon) and the colic ligament of the stomach (also called the omentum).

(viii.) The liver and duodenum descending into the abdomen draw down the umbilical and portal veins and so give rise to the umbilical and portal ligaments. The liver has also its phrenic ligament, consisting of three parts, right, left, and coronary.

(ix.) The Mullerian ducts ultimately form the uterus and its tubes. On each side there is a common mesentery of the uterus and tube, which is regarded as being divided by the attachment of the ovarian mesentery into a mesentery of the uterus and a mesentery of the tube. The common and ovarian mesenteries together form the broad ligament of the uterus.

(x.) The urinary bladder has two lateral and one posterior reflection of peritoneum, and three peritoneal ligaments, one urachal and two ureteric.

(xi.) The testis has a fibrous tunic, a fibrous hilus, and fibrous septa. Its duct forms the epitestis, and its artery, veins, lymph-vessels, and nerves form its cord (e.g., tunica fibrosa, hilus fibrosus, arteria testis, plexus venarum testis, suspensor testis, nervus suspensoris testis, chorda testis).

(xii.) The brain (cerebrum) is developed from three ventricles, each being a bellying out of the neural tube and consisting of a wall and a cavity. The cavity of the second or mid-brain ventricle becomes the mid-brain canal, and that of the third or hind-brain ventricle becomes the hind-brain cavity and hind-brain canal. The first or fore-brain ventricle becomes the thalamus or chamber of the brain (with roof, floor, and four walls), the sides of which have bellied out and become moulded to form the lateral ventricles, the surface of which is marked by coils with intervening fissures and grooves, while the cavity consists of a body with frontal, temporal, and occipital recesses, and has a mouth through which it joins the thalamic cavity.

The brain is intricate enough without hypnotising the student by polysyllabic profundity. Encephalon, rhombencephalon, telencephalon, myelencephalon, prosencephalon, metencephalon, diencephalon, and the rest! "Sack the lot!" No one will suffer apart from the sciolistic lovers of turgid and turbid sonorosity. It is not as though all the above terms were used in the same sense by everyone, for it is worthy of note that those who indulge too freely in such terms are apt to become so intoxicated by the exuberance of their own terminological eloquence that they cannot agree among themselves.

Very little has been said of the organs, but of the making of terms there is no end, and many examples are a weariness of the flesh.

XVIII.—*Afterword.*

Cui bono? Who benefits?

The writer? This was answered by John Barclay in his New Nomenclature at the beginning of last century.

The student? The writer has given up most of his leisure for some 15 years in the belief that if anatomical terminology were set on a proper basis it would greatly "facilitate the progress of study" by removing much of the "rubbish that obstructs the journey." A sound knowledge of anatomy oils the wheels of the medical curricle. Besides, why make the student a terminological inexactitudinarian?

The teacher? The more "rubbish" removed and the less wearisome the labour of the student the easier will be the task of the teacher.

The patient? The sounder the anatomical knowledge of the graduate the better for the patient. The student need not devote his whole course to anatomy, nor need he be kept from graduating until he can enumerate the branchlets of every artery in order and at breakneck speed. He should, however, be given a sporting chance of acquiring in the time at his disposal a serviceable and lasting knowledge of the human body.

There is probably no change suggested above against which objections could not be brought. It is always so much easier to pull down than to build. At one time it is hard to find a suitable term, at another hard to choose the best of several, and so on. Moreover, everything is contingent. One can only make suggestions. The writer has studied the problems involved in the naming of almost every structure in the body, and he believes that if only a definite nucleus were provided the whole terminology would crystallise out. In these strenuous days one cannot devote a lifetime to the complete solution and exposition of a problem the practical issue of which depends entirely on others; but if the authorities responsible for anatomy and for medicine and surgery in general should think the time opportune for revision, the writer, were he able in any way to help, would feel more than repaid for the loss of the leisure of years. Anatomy is among the most precise of sciences. Why should she not lead the way in the science of terminology?

HOSPITAL FUNDS IN BELFAST.—It is announced that a sum of £6000 has been allocated to Belfast by the management of the United Services Fund, of which £1500 is to be given to the Royal Victoria Hospital, £1200 to the Mater Infirmorum Hospital, the balance to be divided among the Children's and other hospitals in Belfast, after deducting £750 to be devoted to the funds of the "Comrades of the Great War" Club. This announcement was made on August 20th at a meeting of the committee in charge of the Hospital Gala Sports Fund, the object of which is to raise £10,000 for hospital institutions in Belfast.

PUBLIC HEALTH IN SOVIET RUSSIA.

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I.—EPIDEMIC DISEASE.

THE visit of the British Labour Delegation to Russia extended from May 10th, when we entered that country at the Russo-Esthonian frontier (near Narva), to June 15th, when we recrossed it on our return. During that period I visited Petrograd for a few days and Moscow for about a fortnight. From Moscow we went to Nijni-Novgorod, on the Volga, where we embarked on a beautiful Volga steamer, the s.s. *Bielinski*, and with the red flag of the Republic, with its R.S.F.S.R. printed in bold letters across its width, fluttering at the prow, sailed down to Astrakhan, on the Caspian Sea, returned thence to Saratoff, and so back by train to Moscow, Petrograd, and out to Esthonia.

During the time I was in Russia I was able to see hospitals and other medical institutions in Petrograd, Moscow, Saratoff, Astrakhan, and other places (small towns and villages on the Volga), and see them in freedom. I talked freely with medical men and women, sometimes in English, more often in French, and even occasionally I stuttered a little German. Only a few doctors are definitely Communists, but practically all doctors (like all others, in fact) are working for the Communist Government. The medical service in Petrograd is under the direction of Dr. Pervouchen; the medical service of the whole of Russia and Siberia, civilian and military, is under the medical control of the Minister of Health (called in Russia the Commissar of Public Health), Dr. Semasko, whose headquarters are at Moscow.

Dr. Semasko is a man of about 43 years of age with a serious, kindly face, a simple and courteous manner, and a real grip of the work he has in hand. Dr. Semasko is a Communist by party, but he is, of course, a man of trained scientific mind, a mind which tries to see facts as they are; he does not wish to exaggerate or to conceal facts. He spoke to me and to my friends with an admirable directness and precision. Some of our conversations were carried on in French and some (for the benefit of those not understanding that language) in Russian through an interpreter chosen by the Labour Delegation from among a non-Communist political group. My notes of conversations were made at the time, and I was supplied also with answers to a questionnaire I put in, and with copies of the official reports published by the Commissariat of Health.

Health Conditions: Absence of Necessities.

There is no doubt that the health conditions in Russia are extremely bad. Great epidemics of cholera, typhus, relapsing fever, Spanish influenza, and minor epidemics of other diseases have occurred, but all have been vigorously combated by the health authorities. Despite the handicap of an almost complete absence of soap, disinfectants, and drugs of all kinds, good work has been done. The figures quoted are those given to me officially, and although one cannot pretend that they are very accurate (registration and notification cannot be relied on), they are sufficiently accurate to give a clear idea of the extent of the epidemics. The population of Russia and Siberia is now estimated at 125,000,000, as the Baltic States and Poland are cut off on the West, and the Far Eastern Republic is the new boundary to the east of Lake Baikal. The whole of the rest of the area of Russia and Siberia, with the exception of Georgia in the south, is one country for practical purposes, although there are political differences in regard to the degree of nearness of affiliation of the Azerbaijan Republic, Turkestan, and so on.

In 1918 there was an epidemic of *cholera* reaching 35,619 cases, which should be compared with the previous epidemic of more than 200,000 in 1908. Credit for this limitation is certainly due to the Commissariat of Health. In 1918 also over 700,000 cases of Spanish *influenza* were registered and a special research instituted to study this disease, the report of which is expected shortly.

Measures taken against Typhus.

In the autumn of 1918 *typhus* appeared in epidemic form and became more widespread in the spring of 1919. 1,299,262 cases were registered in the eight months up to July, 1919, with a death-rate of 8 to 10 per cent. This epidemic particularly affected the cities where food conditions were worst. The typhus died down during the summer, but broke out again in October, November, and December, 1919, the increase coinciding with the advance of the Red Army into Siberia, all the districts evacuated by Koltchak being infected. When the epidemic died down in the East, after heroic measures of burial of corpses and disinfection had been undertaken, it broke out again in the south, again coinciding with the advance of the army into an infected region occupied by Denikin.

DR. SEMASKO,
Commissar of Public Health for all Russia and Siberia.

The measures taken to combat the disease were as follows:—

(1) Cleanliness campaign in army, in towns and in villages by posters and handbills, and by enlisting groups of men, and particularly women, as volunteers to pay house-to-house visits as a propaganda of cleanliness. Much magnified pictures of the louse greet one in public places with sentences such as "The louse is the enemy of the Revolution," and simple explanations of the danger of these parasites. At Petrograd at a theatre where I happened to go the programme contained a note on the danger of lice and instructions to leave the hairy peasant coats a good many people wear in the cloak-room. "Cleanliness weeks" are used as concentrated propaganda, and everyone has to clean and scour, soap being then provided.

(2) One hundred and twenty-five control stations have been established on the railway lines in East and Central Russia providing for disinfection (by steam or formalin or sulphur, but not adequate), for medical inspection, removal of suspicious cases, a bath, hair cut with clippers, and a change of linen. The latter, however, was very difficult to provide. Doctors are always in attendence at these control stations. Total capacity of control stations 6578 per diem. Hospital accommodation is provided near the control stations.

(3) Provision of a special coach on each train for the reception of suspicious cases or definitely diagnosed cases of typhus. This applies to every line in Russia and Siberia.

(4) Medical inspection of military and civilian passengers at railway junctions.

(5) Provision of baths for army at the front—140 in all, with a daily capacity of 148,000 persons. These baths are arranged with entrance-room, washing-room, and dressing-room in three compartments to avoid reinfection. Most baths are of douche type, but some are slipper.

(6) Provision of baths for civilians. (A simple bath-house is common in peasant houses, and a weekly bath is customary.)

Generally speaking, there is enough public bath accommodation in the big towns, capitals of provinces (Gubernias) and their district subdivisions, but only one public bath as a rule for a group of two or three villages (Volost).

An Estimate of their Efficacy.

The figures of typhus for this year enable one to form an estimate of the effect of these measures.

Typhus in All Russia and Siberia in 1920.

(a) *Civilians*—		(b) *Army*—	
February	389,858	January...	66,113
March	313,624	February	75,978*
April	158,308	March	57,251
May	28,000	April	16,505

* Invasion of South—Denikin contacts.

When I visited hospitals in Petrograd, Moscow, Saratoff, and other places there were still large numbers of cases under treatment, but they were diminishing. Dr. Semasko told me that practically every town and village in Russia was infected, and I certainly found this was so at the numerous places where I inquired. A typical example of the condition of affairs was at Beresnaki, on the Volga, a place visited on June 2nd, 1920, and where I went over the hospital entirely on my own initiative. The population of the village was 13,000 (villages in Russia are large agglomerations of people), the hospital was of about 80 beds, a clean, well-kept place. I saw 20 typhus cases in the wards (June 2nd, 1920), about half men and half women. Careful precautions as to wearing a special long gown were insisted upon before entering the wards. The doctor told me there had been about 1000 typhus cases in the village in the winter and about 2000 in the surrounding district. Only 250 were provided with hospital accommodation. This village is in the Saratoff Province, and the doctor (who had had typhus) informed me that 14 per cent. of the doctors of the province had died from the disease. The figures given me in this village probably refer to typhus and to relapsing fever combined, and may include a few typhoid cases as the Russians use the term typhus in common for these three maladies, adding exanthematicus, recurrens or abdominalis.

The figures given me by Dr. Semasko for Russia and Siberia are for typhus only, but an approximately equal number of cases of relapsing fever occurred. There are, however, not (comparatively) many cases of typhoid fever. In Petrograd in May there were about 30 to 40 civilian cases of typhus a day, and about the same number of military cases. The figures for the week May 1st to 7th supplied to me by Dr. Pervouchen from his weekly return (interview May 13th) were typhus 363 cases, relapsing fever 69 cases, typhoid 7 cases. There were also 13 cases of small-pox and 54 of Spanish influenza, as well as other infections in smaller numbers—viz., very acute enteritis 8, dysentery 10, erysipelas 9, measles 2, scarlet fever 2, diphtheria 2. The cases to which these figures refer were those removed to hospital only.

Cholera.

The epidemic in 1918 has already been referred to and in 1919 there were only a few cases. In January of this year there was cholera in 10 places, chiefly in the South of Russia. In one of these, Saratoff, on the Volga, there were 26 cases, in all the others there were 430 cases. By March the number of cases had fallen to 216. The day I left Moscow, May 14th, I heard (not officially, however) that there were 100 cases of cholera in the town. Vivid picture propaganda showing the path of infection of cholera in its different stages—the sick man, washing of linen in river, drinking of unboiled water, &c.—was to be seen very frequently, and the poster was easy to understand whether one could read the words or not. It is to be sincerely hoped that there is not a severe epidemic this summer, as with the increased traffic on the Volga now that fighting with Denikin is over it will spread much more easily. Also the way is now open to the east viâ the Caspian Sea.

Small-pox.

From Nov. 1st, 1918, to July, 1919, there were 81,851 cases registered. In December, 1919, there were 147 cases; January, 182; February, 149; March, 72. Vaccination was made compulsory by decree on April 16th, 1919, and carried out extensively. The Commissariat of Public Health claims to have abolished the disease.

There has been no especially severe epidemic affecting children, and only an occasional sporadic case of plague has occurred, originating from the endemic centre on the Steppe to the east of Astrakhan. Tuberculosis has increased, syphilis has very much increased, especially in the south, where the country has been traversed by invading armies.

(*To be continued.*)

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Austrian Physicians in Russian Captivity: Projected Exchange.

A CONSIDERABLE number of physicians and surgeons hailing from the districts of present-time Austria are still prisoners of war in Siberia. These unhappy men, many of them captured as early as 1914–1915, were never allowed the privilege of returning home when their hospitals were broken up, but they had to continue their work in other parts of the vast country. Even after the formation of the new states by the upheaval of the old Austro-Hungarian Empire, these purely Austrian doctors had to do service amongst Czecho-Slav, Hungarian, Yugo-Slav, or Italian prisoners of war in Asia, whilst medical officers of these nations were sent home. The medical organisation of Vienna has taken up the matter, and has appealed to the profession for volunteers to change places with the men absent from home and family for so long. About 220 men are needed for exchange, which, for political reasons, has hitherto been impossible. It appears that the obstacles have now been removed, and those doctors who have volunteered to go abroad and relieve their homesick brethren have been advised to keep themselves ready for departure at short notice.

American Physicians' Grants for Austrian Physicians.

Professor Pirquet, head of the pædiatric clinic in Vienna, formerly a Johns Hopkins professor at the University of Baltimore, has received from an American Relief Committee consisting of practitioners a cheque for $10,000, to be spent on distributing articles of food to University lecturers and theoretical teachers of medicine in Vienna. Professor Pirquet has fulfilled this wish, at the same time making the grant a means of a scientific research. All persons applying for a gift from this grant were examined as to their nutritional condition according to the "nem" system[1] of Pirquet. It was found that on an average children of the applying families lacked 1–3 kilonem (1000 nem), adults 2–3 kilonem daily in the quantity of food allotted to them by the State and obtainable by the food-tickets. The deficit was provided from the American grant. On an average each family received 154 kilonem per month, and the quantity of food for disposal was estimated as sufficient to last four months. Two hundred families were thus assisted, and after three months exact weights and measurements were taken. It was found that 128 families showed increase of weight, ranging from 4 kg. to 8 kg. per person—proving how greatly

[1] Nutritional value of 1 g. of milk.

underfed these families were. In one case of a family—a father, mother, and two children—the increase was uniform, being 3·3 kg. each after two months only. The food distributed consisted chiefly of white flour, rice, lard, corned beef, and condensed milk in tins. Pregnant women, as well as wet-nurses, received an extra ration of five tins of milk per month. In this way the $10,000 were made to serve the real object for which they were collected.

Increase of Females in the Higher Schools.

The reports of the Board of Schools for the last half year shows a constant increase in the number of girls entering the so-called middle schools, or gymnasia, where Latin and Greek are taught as a preliminary to the examinations for university study. Whilst the boys are taking up more practical vocations—there was a drop of 8 per cent. in the male entries to these schools last year—girls seem to be more and more willing to take up a university career, and their entry has increased by 40 per cent. We have now co-education here, boys and girls being taught in the same classrooms, and the teachers assert that the girls are much more bright and alert than the masculine material the teachers are dealing with at present. This observation should be read along with the account of underfeeding. The increase of female medical students, as well as students of chemistry, has been noteworthy during the last two years.

August 18th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Indian Red Cross.

AT the outbreak of the war no Red Cross organisation as such existed in India. Red Cross work was carried on, in addition to its normal activities, by the St. John Ambulance Association in India until August, 1916, when the Indian Branch of the Joint War Committee was established on the model of the Joint War Committee in England, being a combination of the British Red Cross Society and the Order of St. John of Jerusalem. At this time the combined associations had no separate funds, but were relying on moneys collected by the St. John Ambulance Association and on grants made by the Joint Committee in England. The administrative importance of the Indian Branch of the Joint War Committee was duly recognised in 1917. Collections resulting from "Our Day" appeal enabled relief to be sent to Mesopotamia, East Africa, Egypt, and latterly to the North-West Frontier of India. It is proposed to devote the balance of the funds to the relief of sickness in civil life. The Indian Red Cross Society, which has just come into being, occupies the same position as that of the British Red Cross in the International League of Red Cross Societies. It was considered advisable for the Joint War Committee, which had the backing of all shades of responsible Indian opinion, to establish an independent Indian Red Cross Society, with branches in every province and with functions expanding beyond war work in coöperation with the work of the St. John Ambulance Association and Brigade. With a view to widening as far as possible the field of useful work opening to the Indian Red Cross Society and to the provincial branches the Indian Red Cross Act legalises affiliation with bodies having cognate aims and objects.

Leper Menace in India.

A report has been issued on the work accomplished in India last year by the Mission to Lepers. It is very encouraging, the appeals to Indians having met with substantial support. During the year a number of lepers were discharged from the homes as symptom-free. It is too early to say if they are cured, but there is hope for early cases if they persist in the treatment. The introduction of the Bill for the amendment of the Leper Act marks an epoch in the attitude of the Indian Government to the leper. It is hoped that this measure will be passed during the ensuing session, as its urgency is universally admitted. The original Act provides for the segregation of pauper lepers and control of those following certain callings. In practice it is a dead letter. It has proved of little service, since the police, whose duty it is to take pauper lepers before a magistrate, do not like touching persons suffering from leprosy. Again, a leper in an asylum may leave when he likes. He cannot be detained after his open sores are healed, though he is still a leper and a potential danger to the public. Under the new Bill it will be possible for provincial Governments to segregate compulsorily begging lepers in settlements where they can be carefully looked after and their disease treated by the most modern methods.

Child Welfare in India.

The success attained by the Child Welfare Exhibition at Delhi has been repeated in various other Indian towns where similar entertainments have been organised. It is worthy of record that the total number of persons who visited Delhi were over 50,000, of whom 40,000 were women. These women were drawn from all classes, and their interest was most gratifying to those who assisted in organising the exhibition. The attendance at the women's lectures was so large that it was necessary to charge a small fee to prevent overcrowding. There were 1500 entries for the baby show.

Calcutta Water-supply.

Calcutta has been suffering acutely from a deficient supply of unfiltered water. The old sanitary arrangement, in which the "Mehlei" played so important a part, has disappeared, and the householder is dependent upon the municipality for a supply of unfiltered water for flushing purposes. Much hardship has ensued from the fact that no unfiltered water was to be had on first storeys, and remonstrances were sent to the Water Department without result. It is now announced that the Calcutta Corporation Commissioners have adopted the scheme drawn up by Mr. R. St. George Moore for the improvement of the water-supply.

Sanitation in the Punjab.

The Punjab Sanitary Board has approved of several important drainage systems for the province, and is doing excellent work in organising sanitary effort of every kind and the diffusion of instruction in elementary hygiene throughout the Punjab.

MEDICINE AND THE LAW

Patent Medicines as an Investment.

A PILL manufacturer, summoned at Willesden for the non-payment of rates, complained—we have the authority of *Punch* for August 25th in saying so—that the pill trade had fallen on evil days; "no ex-Service men seem to require pills." The circular, however, received by a member of our staff from a firm of stock-brokers, offering shares in a company, the object of which will be to deal in "specifics" and "remedies," contains a reminder that "profits running into millions of pounds have been made in patent medicines." And the brokers go on to say that their investigations convince them that "huge dividends will be earned and paid on the small capital of £—," concluding that "no investment to-day can possibly offer better prospects." Possible investors may perhaps do well to bear in mind that the prospect of patent medicines as a source of huge dividends may be diminished by the Proprietary Medicines Bill, if it should become law in anything like its present form. How far the Act will affect the sale of proprietary medicines of a harmless character can hardly be foreseen. If it passes in its present form some diseases will be placed beyond the reach of the medicine vendor, and would-be remedies likely to cause injury to health will be removable from the proposed register by administrative order. The sale of medicines containing alcohol and dangerous but unscheduled drugs will also presumably be the subject of regulation and control. The advertising of medicines, not in themselves injurious, by methods of an objectionable character, and likely to mislead the purchaser, will also be stopped to a large extent. The use of fictitious testimonials, the advertisement of a medicine as being recommended by an unnamed medical

practitioner, or as being the invention or discovery of a doctor when this is untrue will be forbidden. Methods of this kind have in the past swelled the "huge dividends" of patent medicine vendors, and raised their profits to millions of pounds. *Punch*, in a poem based upon the pill-manufacturer's complaint, which we began by quoting, puts the matter thus:—

"
Meanwhile you'll understand that I, for one,
Refuse to buy your wares and eat them just for fun,"

which is the common-sense view.

Certificates under the National Health Insurance Acts.

The Minister of Health, acting upon the report of the Inquiry Committee of the London Insurance Committee, has ordered that £50 be withheld from the Exchequer grant to the committee, to be recovered under Article 33 of the Regulations from a medical practitioner on the London panel. This heavy fine is inflicted in the following circumstances. The practitioner had given certificates in the usual form, stating that he had examined the patient on the dates named in them in respect of a patient whom he had not in fact visited for some time. He was aware that the patient had returned to his home from an infirmary in October, 1919, and gave the certificates up to January, 1920, when the patient died. It was not disputed that the patient was during this period incapable of work, or that in the practitioner's opinion he could never be otherwise. The penalty is a heavy one, but it must be remembered that it was in the power of the Minister to remove the practitioner from the panel, and that to furnish a certificate at variance with the facts is not only a breach of the regulations, but is wholly unjustifiable in principle. A medical certificate of incapacity which states that a patient has been seen by the certifier is evidence from a trusted witness that he is alive and entitled to sickness benefit. A man may be certainly and inevitably dying, but the fact of his being beyond question alive is important, and if fraud is rare and difficult to perpetrate it is not impossible or inconceivable. One of the allegations made against our admittedly faulty system of death registration is that it does not effectively prevent burial without the presentation of the prescribed certificate, and that a certificate obtained for one person can thus be kept and used for another whose death has not been registered. Such fraud may be neither frequent nor easy, but in so far as it can occur, it would render possible the payment of sickness benefit in respect of a person who was dead. That no fraud should have been perpetrated or dreamt of by anyone in a particular case does not detract from the importance of certificates relating to sickness or death being absolutely accurate and trustworthy.

A Coroner on Expert Anæsthesia.

An inquest held lately upon the body of a young woman who died under chloroform was the occasion for interesting comment on the part of the coroner. The medical features of the case were not, so far as the scanty details available show, unusual and merely enforce the well-known lesson that anæsthetics have special danger in the presence of acute cellulitis of the neck. In the case in question the anæsthetic was administered by a casualty officer, and the coroner stated that owing to the dangerous nature of operation for cellulitis of the neck it would have been better if one of the visiting anæsthetists could have been in charge. This is a counsel of perfection. It is an unfortunate but unavoidable anomaly of hospital practice at present that many of the most dangerous and difficult subjects for anæsthesia fall into the hands of the less experienced administrators. They are subjects for emergency operation and have to be treated when the expert anæsthetists are away from the hospital. It can hardly be otherwise unless there is always at the hospital a resident anæsthetist, as there is at many hospitals a resident surgeon. Most of the great hospitals now do possess a resident anæsthetist, and often he is a man of wide experience compared with that of the other residents. Further progress may ensure the constant presence in large hospitals of an anæsthetist whose standing is on a par with that of the resident surgeon or physician.

URBAN VITAL STATISTICS.

(Week ended August 21st, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·9, 9·6, and 9·4 in the three preceding weeks, rose to 9·9 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·8, or 1·3 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 3·9 in Hornsey, 4·0 in Swindon, and 4·3 in Ealing to 15·4 in South Shields, 15·7 in West Bromwich, and 16·0 in Burnley. The principal epidemic diseases caused 204 deaths, which corresponded to an annual rate of 0·6 per 1000, and comprised 129 from infantile diarrhœa, 35 from diphtheria, 17 from whooping-cough, 16 from measles, 5 from scarlet fever, and 2 from enteric fever. Measles caused a death-rate of 1·6 in Wolverhampton, but the mortality from the remaining epidemic diseases showed no marked excess in any of the large towns. There were 2150 cases of scarlet fever and 1362 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2106 and 1413 respectively at the end of the previous week. The causes of 27 of the 3394 deaths in the 96 towns were uncertified, of which 8 were registered in Birmingham, 4 in Liverpool, and 3 in South Shields.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 11·2, 11·1, and 12·3 in the three preceding weeks, fell to 10·8 per 1000. The 235 deaths in Glasgow corresponded to an annual rate of 11·0 per 1000, and included 11 from infantile diarrhœa and 1 each from scarlet fever and whooping-cough. The 75 deaths in Edinburgh were equal to a rate of 11·5 per 1000, and included 3 from scarlet fever and 2 from diphtheria.

Irish Towns.—The 106 deaths in Dublin corresponded to an annual rate of 13·3, or 0·2 per 1000 above that recorded in the previous week, and included 5 from infantile diarrhœa and 1 from whooping-cough. The 68 deaths in Belfast were equal to a rate of 8·6 per 1000, and included 4 from infantile diarrhœa and 1 from whooping-cough.

(Week ended August 28th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·6, 9·4, and 9·9 in the three preceding weeks, was again 9·9 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·7, against 9·8 per 1000 in the previous week, while among the remaining towns the rates ranged from 3·7 in Edmonton, 3·9 in Hornsey, and 4·9 in York, to 16·8 in South Shields, 17·2 in Stockton-on-Tees, and 17·5 in West Hartlepool. The principal epidemic diseases caused 237 deaths, which corresponded to an annual rate of 0·7 per 1000, and comprised 150 from infantile diarrhœa, 34 from diphtheria, 23 from measles, 20 from whooping-cough, 9 from scarlet fever, and 1 from enteric fever. The deaths from infantile diarrhœa, which had been 87, 93, and 129 in the three preceding weeks, further rose to 150, and included 38 in London, 13 in Liverpool, 9 in Birmingham, and [illegible] each in Sheffield and Hull. There were 2266 cases of scarlet fever and 1391 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2150 and 1362 respectively at the end of the previous week. The causes of 34 of the 3395 deaths in the 96 towns were uncertified, of which 8 were registered in Birmingham and 3 in Liverpool.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 11·1, 12·3, and 10·8 in the three preceding weeks, rose to 11·1 per 1000. The 270 deaths in Glasgow corresponded to an annual rate of 12·7 per 1000, and included 16 from infantile diarrhœa, 6 from small-pox, 2 from enteric fever, and 1 each from measles, scarlet fever, and whooping-cough. The 77 deaths in Edinburgh were equal to a rate of 11·8 per 1000, and included 2 from infantile diarrhœa and 1 from diphtheria.

Irish Towns.—The 122 deaths in Dublin corresponded to an annual rate of 15·3, or 2·0 per 1000 above that recorded in the previous week, and included 4 from infantile diarrhœa, 2 each from whooping-cough and diphtheria, and 1 from enteric fever. The 105 deaths in Belfast were equal to a rate of 13·3 per 1000, and included 8 from infantile diarrhœa and 1 each from scarlet fever and diphtheria.

THE Médaille de la Reconnaissance Française (argent) has been conferred by the President of the French Republic on Mrs. Bedford Fenwick, honorary superintendent of the French Flag Nursing Corps.

REGISTRABLE COLONIAL AND FOREIGN MEDICAL DEGREES.

UNDER the Medical Act, 1886, a number of medical diplomas granted in British possessions entitle their holders to be registered without further examination in the Colonial List of the (British) Medical Register. The condition attached to such registration is that the holder of the colonial diploma obtained it when he was not domiciled in the United Kingdom or in the course of a period of not less than five years during the whole of which he resided out of the United Kingdom. Some account is here given of these diplomas and of the course of study required to obtain them. The information has in most cases been supplied or confirmed by the authorities of the university or corporation, to whom our best thanks are offered.

AUSTRALASIA.

Summary of Registrable Degrees.—New South Wales: University of Sydney, (1) M.B., (2) M.D., (3) Ch.M. New Zealand: University of New Zealand, (1) M.B., Ch.B., (2) M.D. South Australia: University of Adelaide, (1) M.B., B.S., (2) M.D., (3) M.S. Victoria: University of Melbourne, (1) M.B., (2) M.D., B.S.

University of Adelaide.

The University of Adelaide[1] was established by Act of the South Australian Legislature in 1874. In 1883 Sir Thomas Elder gave £10,000 for the foundation of a school of medicine. The Medical Acts of 1844 and 1880 set up a South Australian Medical Board to issue certificates of legally qualified medical practice.

Preliminary Examination.—Before entering upon the medical course candidates must have passed the Senior Public Examination in at least five subjects, and the higher standard in physics, chemistry, and biology, either of the Higher Public Examination or first year Science.

M.B., B.S.—The five years' course includes five examinations held in November of each year. At the first the subjects are anatomy and dissections, physiology, organic chemistry, and physical chemistry; at the second, anatomy, physiology, and materia medica; at the third, medicine, surgery (including clinical), regional and surgical anatomy, bacteriology; at the fourth, medicine (including clinical), surgery (including surgical anatomy and clinical surgery), pathology, obstetrics, and forensic medicine (including insanity); at the fifth, medicine (all branches), surgery (including surgical anatomy and operative surgery), gynæcology, ophthalmology, otology, therapeutics, and public health and preventive medicine. The fee for each examination is £3 3*s*. and for the degree £5 5*s*. Fees for the five years' course of study amount to £145 19*s*. There were 96 undergraduate students in 1919.

M.D.—Candidates must have been Bachelors for at least nine academic terms, which may be shortened on the recommendation of the Faculty of Medicine. The subject of examination may be selected from the following: General medicine, diseases of the nervous system, pathology, obstetrics, State medicine. A thesis may be submitted. Fee for the examination £15 15*s*., for the degree £10 10*s*.

M.S.—The conditions are similar to those for the M.D. Choice of subject may be made from: Gynæcology, the surgery of the abdomen, the surgery of the special senses and throat; in addition to examination in the principles of surgery.

University of Melbourne.

The University of Melbourne[2] was incorporated by Act of the Victorian Legislature in 1853. The Medical Act of 1890, substantially amended in 1906, set up the Medical Board of Victoria to register legally qualified medical practitioners.

Preliminary Examination.—All candidates must possess the School Leaving Certificate, which is based on education in a secondary school during four years. The Intermediate Certificate must have been taken at least a year before the School Leaving. English is compulsory at the higher standard; Latin and geometry with trigonometry at the lower.

M.B., B.S.—The course extends over five calendar years, and is divided into two equal parts, hospital practice being confined to the second half. The first year (Division I.) is devoted to natural philosophy, chemistry, zoology, and botany; the remainder of the first half (Division II.) to anatomy and physiology. Two complete courses of dissections are compulsory. Hospital practice extends through Divisions III. and IV. The general hospitals ranking as clinical schools are the Melbourne Hospital, the Alfred Hospital, and the St. Vincent's Hospital. The recognised special hospitals include the Women's Hospital, the Children's Hospital, the Eye and Ear Hospital, the Infectious Diseases Hospital, the Receiving House, and Acute Mental Hospital. A full clinical curriculum is arranged, both general and special, with clinical lectures. In Division III. (lasting one year) courses of lectures are given in pathology (with practical work in histology and in bacteriology), in therapeutics, public health, materia medica and pharmacy, and regional and applied anatomy, and examination in all these subjects follows immediately. In Division IV., lasting a year and a half, systematic lectures are confined to the first year and include medicine, surgery, and forensic medicine. Lectures on obstetrics and gynæcology are given in Division III., but the examination in these subjects is postponed till the final at the end of the course, which also includes the subjects of Division IV. Clinical medicine and clinical surgery rank as separate subjects in the finals.

Honour examinations with exhibitions are held in all subjects of Divisions I., II., and III., and there is a final honour examination with scholarships in medicine, in surgery, and in obstetrics and gynæcology.

The yearly fee payable to the University is £23, with a sports fee of 1 guinea and a club-house fee of 1 guinea. The hospital and pharmacy fees in Divisions III. and IV. amount to £69 6*s*. The total fees are £194 16*s*. The degree fee for M.B., B.S., is 7 guineas.

The number of students for the full course now in attendance is 732. Provision is also made for instruction to dental students, massage students, single subject students, &c.

M.D.—Candidates must be Bachelors of Medicine of two years' standing. They may proceed either by thesis or by examination. The thesis must be a substantial contribution to medical knowledge. The examination includes medicine, with either obstetrics and medical gynæcology, or diseases of children, or diseases of the nervous system, including insanity. Subject to a dispensing power in the case of theses of great merit, all candidates must pass an examination in clinical medicine. The fee for examination and degree is 10 guineas.

M.S.—Candidates must be Bachelors of Surgery of two years' standing. Part I. of the examination includes surgical anatomy and surgical pathology. Part II. includes surgery in all branches. The two parts may be taken together or separately. No candidate can pass in Part II. who has not passed in Part I. The fee for examination and degree is 10 guineas.

Diploma of Public Health.—Granted under conditions agreeing with those in the United Kingdom. Fees for instruction are 32 guineas, apart from fever hospital practice. The fee for examination is 10 guineas, for diploma 3 guineas.

Diploma of Tropical Medicine.—Candidates must be qualified medical practitioners, and must have passed Part I. for D.P.H. or have undergone a special training in lieu thereof. They are trained in tropical medicine at the Australian Institute of Tropical Medicine, Townsville, Queensland, having a three months' course of theoretical and practical instruction, followed by a three months' clinical course in the Townsville Hospital. The examination is conducted at the institute. Fee for preliminary course is £2 2*s*.; for course at institute, 10 guineas; for examination and diploma, 5 guineas.

Affiliated Colleges.—Trinity College (1872), Ormond College (1879), Queen's College (1888), and Newman College (1918) are affiliated to the University and have medical tutors.

[1] The University Registrar is Mr. C. R. Hodge. The Calendar of the University of Adelaide (1920) is a volume of 534 pp., printed by W. K. Thomas and Co., Grenfell-street, Adelaide. Price 2*s*. 6*d*.

[2] The University Registrar is Mr. J. P. Bainbridge, J.P. The Melbourne University Calendar (1920) is a volume of 1111 pp., printed for the University by Ford and Son, Drummond-street, Carlton, Melbourne. Price 3*s*.

University of New Zealand.

The University of New Zealand was established by Act of the New Zealand Legislature in 1870. The Medical Act of 1908 provided for the registration of medical practitioners. The University has no fixed home or buildings; it is an examining body with four affiliated colleges—namely, University of Otago, Dunedin; Canterbury College, Christchurch; Auckland University College; and Victoria University College, Wellington. The degrees of M.B., Ch.B., M.D., and B.D.S. are conferred, and the subjects of study are Biology, Physiology, Medicine and Surgery, Ophthalmology, Chemistry, Bacteriology and Public Health, Anatomy, Pathology, Midwifery and Gynæcology, and Dentistry. The agent in England is J. W. Joynt, Esq., M.A., 11, Torrington-square, London, W.C. 1.

University of Sydney.

The University of Sydney [3] was incorporated by Act of the New South Wales Legislature in 1850. The Medical Practitioners Act of 1898 provides for the registration of legally qualified medical practitioners.

Matriculation Examination.—Latin and another language other than English are required, one at the Higher standard.

M.B., Ch.M.—The course of study extends over a period of five years. Five degree and a final examination are held: (1st year) in physics, chemistry, botany and zoology; (2nd year) in anatomy and physiology; (3rd year) in the entire subjects of anatomy and physiology, every part of the body having been dissected at least once; (4th year) in pathology, surgical anatomy and operative surgery, materia medica, and therapeutics: (5th year) in medical jurisprudence and public health; (final) in medicine, surgery, obstetrics, and gynæcology. Certificates of proficiency in vaccination and anæsthetics are required. The fee for each degree is £10. The number of students attending degree courses during 1919 was 876—783 men and 93 women.

M.D.—Candidates must, after obtaining the degree of Bachelor, have spent at least two years in medical or surgical practice or in approved study. Examination is written or oral in one of the following subjects: medicine, medical jurisprudence and public health, surgery, obstetrics and gynæcology; or in any of the scientific subjects included in the medical curriculum. A thesis must be presented two months before the examination. The fee for the degree is £10.

Diploma in Public Health.—Candidates must be registered practitioners of not less than 12 months' standing. The examination is in two parts: (1) relating to the general principles of sanitary medicine; (2) relating to State medicine and to the applications of pathology and sanitary science to public health. The fee is £10.

Affiliated Colleges.—Matriculated students are admitted to the following resident colleges—namely, St. Paul's College (Church of England), St. John's College (Roman Catholic), St. Andrew's College (Presbyterian), Wesley College (Methodist), the Women's College (undenominational), at which scholarships and bursaries are available.

Recognised Hospitals are the Royal Prince Alfred Hospital with medical school, the Sydney Hospital with clinical school, St. Vincent's Hospital, the Royal Hospital for Women, the Royal Alexandra Hospital for Children, the Glandesville and Callan Park Hospitals for the Insane, the Women's Hospital, the Renwick Hospital for Infants, and the South Sydney Hospital for Women.

BRITISH NORTH AMERICA.

Summary of Registrable Degrees and Diplomas.—Alberta: College of Physicians and Surgeons, Member. Manitoba: College of Physicians and Surgeons, Member; University of Manitoba, M.D., C.M. New Brunswick: Provincial Council of Physicians and Surgeons, L.M.S. Newfoundland: Medical Board, L.M.S. North-West Territories: College of Physicians and Surgeons, Member (when held in conjunction with the licence of Alberta or Saskatchewan). Nova Scotia: Provincial Medical Board, L.M.S.; Dalhousie University, M.D., C.M. (Halifax Medical College, M.D., C.M., if obtained prior to August 31st, 1911). Ontario: College of Physicians and Surgeons, Member. (To this can be added as additional qualifications the degrees in medicine of the Queen's University, Kingston; the Western University, London; and the University of Toronto.) Prince Edward Island: Medical Council, L.M.S. Quebec: McGill University, M.D., C.M.; Laval University, M.D. Saskatchewan: College of Physicians and Surgeons, Member.

Dalhousie University, Halifax, Nova Scotia.

The work of Halifax Medical College was discontinued in 1911, when instruction in all subjects of the medical curriculum was undertaken by Dalhousie University. The professional examinations are conducted conjointly by the university and the Provincial Medical Board of Nova Scotia (see below).

M.D., C.M.—In addition to the matriculation or preliminary examination candidates are required to pass five professional examinations. For admission to the classes of the third or any higher year the undergraduate must have passed in all the subjects of the preceding year. The curriculum for the third year still includes practical anatomy and advanced physiology, while the fifth (final) year subjects are given as: Surgical anatomy, operative surgery, clinical surgery, clinical medicine, clinical pediatrics, clinical obstetrics, practical obstetrics, clinical gynæcology, mental diseases, skin diseases, eye, ear, nose and throat diseases, dressing, clerking, vaccination, post mortems, hospital, medical ethics. To win distinction in any subject a mark of 75 per cent. or over is required. The total tuition fees in any year amount to $125, with $10 additional for the third, fourth, and fifth years. The fee for each examination is $10. There were 160 medical students of all years in 1919–20. Dean of the Faculty, John Stewart, M.B. Edin., LL.D. Edin. and Dal.; Secretary, Professor Fraser Harris, M.D., D.Sc.

Queen's University, Kingston, Canada.

Queen's College, Kingston,[4] was established by Royal charter in 1841, assisted by grants from the Presbyterian Church in Scotland. Classes in medicine were first held in the University in 1854. The Medical School, conducted for a time under the charter of the Royal College of Physicians and Surgeons at Kingston, became an integral part of the University in 1892. Kingston General Hospital (230 beds) is adjacent to the University buildings.

M.D., C.M.—Candidates for a degree must pass the Junior Matriculation of the University or its equivalent. The course comprises five sessions of eight months each. A combined B.A. and M.D. course may be taken in seven years. Foreign students must spend at least one full session in the University. Examinations are held at the end of each session. The average cost per session of eight months, including board and lodging, is $376–$435. All students are expected to attend a church of the denomination to which they profess to belong.

D.Sc.—Granted on a thesis embodying original research of importance to medical science not earlier than two years after graduation. A reading knowledge of scientific French and German is required.

D.P.H.—The diploma is granted to those holding the M.D., or M.D., B.Sc., after examination following prescribed study, which includes six months with a recognised medical officer of health in the study of practical sanitation.

Laval University, Quebec.

Laval Catholic University [5] was incorporated by Royal Charter in 1852, absorbing the Quebec School of Medicine organised four years earlier. The first class graduated in 1855.

M.B., M.D.—The entrance examination includes Latin, philosophy, and Canadian history, and its standard is prescribed by the College of Physicians and Surgeons of Quebec. The Faculty of Medicine confers a baccalauréat and a doctorat, the former after 2 years, comprising 6 terms of study, the latter after 3 further years. Examinations are held in June at the end of each year of study. The total fee for examinations is $15, for the diploma of bachelor $5, and for that of doctor $20. Fees paid by enrolled students for the medical course amount to $45 a term.

[3] The University Warden and Registrar is Mr. H. E. Barff, M.A. The Calendar of the University of Sydney (1920) is a volume of 740 pp., printed for the University by Angus and Robertson, Ltd., Sydney. Price 2s. 6d.

[4] The Secretary of the Medical Faculty is Dr. A. R. B. Williamson, Queen's University, Kingston, Ont.

[5] The Medical Department of Laval University was destroyed by fire on Nov. 24th, 1919, and is now in process of rebuilding. The Secretary of the Medical Faculty is M. Arthur Vallée.

McGill University, Montreal.

The Faculty of Medicine of McGill University[6] arose out of the Montreal Medical Institution, organised as a medical school in 1823-24, and incorporated in the University in 1829.

Preliminary Examination.—Before registration an undergraduate in medicine must have passed the Matriculation Examination of the University or its equivalent. The examination is held twice yearly at McGill, and once at Calgary, Regina, Winnipeg, Toronto, St. John, and Truro. Also in June in London (apply to Secretary, Headmasters' Conference, 12, King's Bench Walk, E.C.). Latin, and either Greek, French, or German must be taken. Every student entering the University is required to pass a physical examination to detect defects and weaknesses amenable to treatment. Board and lodging can be obtained in private houses in the vicinity of the University at $40 a month upwards.

M.D., C.M.—The undergraduate course in medicine has this year been increased to six years by a pre-medical year devoted to chemistry, physics, and biology, with English and one modern language. This readjustment gives a final year confined to hospital work, including medicine, surgery, obstetrics, gynæcology, ophthalmology, oto-laryngology, pathology, and dermatology. The third year now embraces anatomy (neurology), physiology, general pathology, bacteriology, chemistry (physiological and clinical), parasitology, pharmacology, and clinical microscopy. During this year students begin to visit the hospitals and receive instruction in small groups in the elements of clinical medicine and clinical surgery. Examinations are held in the subjects of each successive year. The total faculty fees for the medical course of six years are $1200, payable in twelve instalments of $100 each. The degree fee is $30. 624 medical students were enrolled in the session 1919-1920.

D.P.H.—This course, cancelled during the war, has now been resumed.

New Brunswick, Council of Physicians and Surgeons

The Council of Physicians and Surgeons of New Brunswick is empowered by the Medical Act to issue a licence (L.M.S.) conferring the legal right to practise. The usual matriculation examination is required and the graded collegiate course comprises five sessions of not less than eight months each. The examinations are held twice a year at St. John, N.B., the fee being $30. Candidates may appear for the primary examination at the end of the second year of study. The fee for the licence is $3 and the registration fee $40. The registrar of the council is Dr. S. Skinner, 64, Charlotte-street, St. John, N.B.

Nova Scotia, Provincial Medical Board.

A licence (L.M.S.), legally entitling to practise, is issued by the Provincial Medical Board of Nova Scotia to those who have satisfied requirements in respect to preliminary and professional education. After registration in the Medical Students' Register (fee $25) a course of at least five full years in medicine must be taken. Graduates of medical schools recognised by the Board who can submit satisfactory schedules of studies are admitted to the third (final) professional examination (fee, including registration, $75). All applicants for registration must take this examination except licentiates of the General Medical Council of the United Kingdom and of the Medical Council of Canada, who are admitted to registration without examination upon payment of a fee of $50. The registrar of the Board is Dr. W. H. Hattie, Halifax, N.S.

University of Toronto.

The University of Toronto,[7] Ontario, took its title in 1849, a Royal Charter having been granted in 1827. The Faculty of Medicine was re-established in 1887 under the Federation Act. Victoria College (1892), Trinity College (1904), and St. Michael's College (1907) are integral parts of the University.

Preliminary Examination.—The matriculation certificate of the University is required from entrants unless they are graduates in Arts of a Dominion or British University or possess a certificate of entrance into the Faculty of Education.

M.B.—The undergraduate course has just been lengthened to six years. Six examinations are taken in succession at the end of the session. The early years aim at giving such a training in sciences as is now exacted of those who desire to obtain a British as well as a Canadian qualification. During the third year an attempt is made to bridge the gap between the primary scientific and the final clinical subjects by taking up anatomy and physiology at the same time as surgery and medicine throughout the year. Preliminary courses in pathology and pathological chemistry are taken; instruction is given in pharmacology; and a series of ten lectures delivered on psychology. The final year includes courses on anæsthesia, dentistry, medical ethics, history of medicine, and life insurance. The annual fee for regular students with one annual examination is $150. Combined courses of B.A., M.B. and B.Sc., M.B., lasting seven years, are also arranged. Honour standing can be obtained in each year's subjects. There is residence for about 150 men and three houses near to the University. Each male student proceeding to a degree must take physical training, the character to be determined by medical examination in the first two years of his attendance.

M.D.—One year must elapse after obtaining the M.B. degree and an approved thesis submitted.

D.P.H.—Candidates must be graduates in medicine of this or some other University. The curriculum extends over a winter session of eight months and a summer session of three months. The fee for the course is $150 and for the diploma $20.

NEAR EAST.

Registrable Degrees.—University of Malta, M.B., Ch.B., M.D., Ch.M.

University of Malta.

The University of Malta was added in 1898 to the list of institutions recognised by the English Royal Colleges. Study in the Faculty of Medicine and Surgery[8] is open to matriculated students who have attended a three years' preparatory course in the Faculty of Science. Matriculation includes English, Italian, and Latin, while history is also necessary to comply with the G. M. C. regulations. The preparatory course in science in its third year comprises English or Italian literature, physics, organic chemistry, and human anatomy and general histology, with dissection. Medical botany is taught at the Botanic Garden. The academical course of medicine and surgery (*M.B.*, *Ch.B.*) extends over four years, the first year being devoted solely to anatomy and physiology, and the final year including clinical medicine, surgery, and midwifery, along with skin diseases, mental diseases, operative surgery, and forensic medicine, and continued attendance at the clinical laboratory and the hospital. The degree of *M.D.* or of *Ch.M.* is conferred on any M.B., Ch.B. on passing an examination at not less than one year after graduation, in each case with an approved thesis. The fee for any of the three degrees is £6.

FAR EAST.

Summary of Registrable Degrees.—Ceylon: Medical College, L.M.S. Hong-Kong: University of Hong-Kong, M.B., B.S. India: University of Allahabad, M.B., B.S.; University of Bombay,[9] (1) L.M.S., (2) M.B., B.S., (3) M.D., (4) M.S.; University of Calcutta, (1) L.M.S., (2) M.B., (3) M.D., (4) M.S., (5) M.O.; University of Madras,[10] (1) M.B., M.S., (2) M.B., B.S., (3) M.D.; Punjab University, (1) L.M.S., (2) M.B., (3) M.D., (4) M.S. Straits Settlements: King Edward VII. Medical School, Singapore, L.M.S.

University of Allahabad.

The examination for the degree of *M.B.*, *B.S.* consists of three parts: preliminary scientific, first degree, and final degree. The two latter are held at Lucknow. The preliminary scientific examination in chemistry, physics, and biology is open to candidates who have passed in these subjects at the intermediate examination of the University. The first degree examination comprises anatomy, physiology,

[6] The University registrar is Mr. J. M. Nicholson, M.A. The registrar of the Faculty of Medicine is Dr. J. W. Scane. The Annual Calendar of the Faculty of Medicine and Department of Dentistry is a volume of 90 pp., printed by the Gazette Printing Co., Ltd., Montreal.

[7] The Secretary of the Faculty of Medicine is Dr. E. S. Ryerson.

[8] Statute of the University of Malta, 1915, Government Printing Office, Malta, price 1s.

[9] If obtained after June 25th, 1912, the degree must have been registered in the Presidency.

[10] If obtained after June 1st, 1916, the degree must have been registered in the Presidency.

and materia medica and pharmacy; it may be taken after two years. The final degree examination comprises two groups: (A) midwifery, hygiene, and medical jurisprudence, taken after two years; (B) medicine, surgery, and pathology, taken a year later. Honours may be obtained in any subject. The *M.D.* and *M.S.* degrees are obtained within not less than one year on passing an examination in medicine and pathology. The fees for the M.B., B.S. examination are Rs.140, for the M.D. and M.S. Rs.200 each.

King George's Medical College, Lucknow, prepares students for the medical degrees of the University of Allahabad. The curriculum extends to five college years, each of three terms. Scholarships and bursaries are granted.

University of Bombay.[11]

Candidates for the *M.B.*, *B.S.* must have passed the first year arts examination or its equivalent, and be engaged during five University years in professional study at a medical college recognised by the University. Three examinations are held: the first, or preliminary scientific; the second, or intermediate; and the third, or final; each of them twice in the year. The two former are of the usual character. The final is divided into two parts, which may be taken together or separately two years after the intermediate. Part I. includes medicine, medical jurisprudence, pathology, and hygiene; Part II. surgery, midwifery, and ophthalmology. 561 medical undergraduates passed examinations in 1919–20. Candidature for the degrees of *B.Hy.*, *M.D.*, *D.Hy.*, or *M.S.* implies that the M.B., B.S. degree has been taken not less than three years (B.Hy., one year) previously.

Grant Medical College, Bombay, was established in 1845, to "teach the system of Western medicine and to extend the benefit of Western medical instruction to the Natives of Western India," and recognised by the University in 1860. Attached is a laboratory for scientific medical research. The students are arranged in three classes: (1) graduates and undergraduates of the University of Bombay and other recognised Universities who are educated through the English language for medical degrees; (2) members of the European and domiciled European communities who are educated through the English language for the grade of military assistant surgeon; (3) undergraduates and others for the diplomas of the College of Physicians and Surgeons, Bombay.

University of Calcutta.[12]

For the degree of *M.B.* the preliminary scientific, first, and final M.B. examinations must be passed. The final is divided into two parts, major and minor, which may be taken together. The former includes medicine, surgery, and midwifery; the latter general pathology, medical jurisprudence, and hygiene. An examination for honours is held a week after the pass list is declared. The fees for the three examinations are Rs. 25, Rs. 30, and Rs. 50 respectively. The *M.D.* degree is granted after examination in medicine, pathology, and mental diseases not less than one year subsequent to the M.B. The fee is Rs. 100. Degrees of Master of Surgery (*M.S.*) and Obstetrics (*M.O.*) are also granted. A diploma in public health is granted to possessors of the M.B. degree or L.M.S. diploma by examination after a prescribed course of a year has been carried out. The fee is Rs. 100.

Ceylon Medical College.

The Ceylon Medical College[13] began in 1870, and the curriculum and examinations were revised in 1901 in conformity to modern requirements. In 1888 the licence in medicine and surgery (*L.M.S.*) granted by the College was recognised by the General Medical Council of the United Kingdom. Lady students were first admitted in 1892. There are two department in the College—viz., Medical and Apothecary. For admission to the Medical Department of the College candidates must pass Cambridge Senior Local or Senior School Certificate Examination or the London Matriculation Examination in the required subjects. The first professional examination is passed at the end of the first year, the second at the end of the third, the third at the end of the fourth, and the final at the end of the fifth. The fifth year's course includes, besides the usual final subjects, instruction in tropical medicine, skiagraphic demonstrations, and attendance at fever and leper hospitals. The total fees for the medical curriculum, including examination fees, amount to Rs. 1423.50. Various scholarships and medals are awarded by Government and private donors.

University of Hong-Kong.

The Faculty of Medicine of the University of Hong-Kong (1912) had its origin in the work of the Hong-Kong College of Medicine founded in 1887. The School of Anatomy was opened in 1913 and special schools for physiology, pathology, and tropical medicine were opened in 1918 and 1919. The University confers the degrees of *M.B.*, *B.S.*, *M.D.*, and *M.S.* The subjects of the first medical examination are physics, chemistry, and biology; of the second, Part I., anatomy, physiology, Part II., general pathology (including bacteriology), and elementary pharmacology; of the third, Part I., surgery and midwifery, Part II., medicine and pathology, including hygiene and tropical medicine. The fee for each part of each examination is $5, and for conferring the M.B., B.S. $25. The candidate for *M.D.* may present himself in two years and must take general medicine as well as one of the following: State medicine, pathology, midwifery, tropical medicine, physiology. The rules for *M.S.* are similar. The fee for each examination is $100 and for conferring the degree $100. The acting Registrar of the University is Mr. K. Brayshay, B.A.

University of Madras.

A medical school was established in Madras in 1835, which became the Madras Medical College in 1851 and was affiliated to the University in 1877. The College was originally for supplying assistant surgeons and hospital assistants to the army, but now undertakes also the training of students for the medical degrees and diplomas of Madras University. Candidates for the degrees of *M.B.*, *B.S.* must have passed the Intermediate Examination in Arts of the University or its equivalent, and have studied medicine for not less than five years in a college affiliated to the University. Four examinations are held, the third (at the end of the third year) comprising general pathology and hygiene, and the fourth the other professional subjects. The examination fees are Rs.25, Rs.25, Rs.40, and Rs.50 respectively. The *M.D.* degree may be taken not less than one year after a first-class pass in either medicine, midwifery, pathology, or tropical medicine. The conditions for the *M.S.* degree are similar. The examination fee in each case is Rs. 100. A degree in sanitary science (*B.S.Sc.*) can be taken in two parts one year after the M.B., B.S., the total fee being Rs.100.

The Madras Medical College includes a college department, an apothecary department, a chemists' and druggists' department, and a sanitary inspectors' department. The course of training for the M B., B.S. is charged Rs. 120 a year, or a lump sum of Rs.540 if paid in advance. Valuable scholarships are awarded by the Government and by the Dufferin Fund, and special Government stipends to women medical students.

Punjab University.

An examination for the degree of *M.B.*, *B.S.* is held annually in Lahore in May, and consists of three parts—first, second, and final. The first professional examination is open to candidates who not less than two years previously have passed the intermediate examination of the Science Faculty taking the medical student's group; it comprises anatomy, physiology, and materia medica, and the fee is Rs. 30. The second examination is in pathology, forensic medicine, and hygiene, and is taken at the end of the third year; the fee is Rs. 30. The final examination, for which the fee is Rs. 40, is taken at the end of the fifth year and comprises the rest of the professional subjects.

King Edward Medical College, Lahore, trains students for the medical degrees and diplomas of Punjab University. The college year consists of one long session of three terms. The course for the M.B., B.S. occupies five years, the fees being Rs.125, Rs.115, Rs.135, Rs.105, and Rs.105 in successive years. College scholarships are granted.

[11] The Registrar of the University is Mr. K. B. F. M. Dastur, M.A. The Bombay University Calendar (1920) vol. i. is a of book 662 pp., printed at the Government Central Press, Bombay.

[12] The University of Calcutta Regulations (1919) make a volume of 410 pp., published by the University. The Calendar is a volume of 814 pp., also published by the University.

[13] The Registrar of the college is Dr. P. J. Kelly. The Ceylon Medical College Calendar (1919–20) is a volume of 38 pp., published by authority and printed by H. R. Cottle, acting Government printer, Colombo.

REGISTRABLE FOREIGN MEDICAL DEGREES.

Certain medical diplomas granted in foreign countries also entitle to registration in the foreign list of the Medical Register, provided that the holder is not a British subject or that, being a British subject, the diploma was obtained under domiciliary conditions similar to those attached to colonial diplomas.

Summary of Registrable Degrees (the date in parentheses being the year in which Part II. of the Medical Act, 1886, was applied to the country in question).—*Italy* (1901): Degrees of Doctor of Medicine and Surgery of all the Royal Italian Universities. *Japan* (1905): Degrees of Bachelor of Medicine (Igakushi) and Doctor of Medicine (Igaku Hakushi) of the Imperial Universities of Japan; and the Degree of Bachelor of Medicine (Igakushi) of any Government or Prefectural special medical college, or of a private special medical college designated by a Minister of Education of the Empire of Japan. *Belgium* (1915): Degrees of Doctor of Medicine of the Belgian Universities of Brussels, Ghent, Liége, and Louvain, which give legal authority to practise medicine, surgery, and midwifery in Belgium.

Italy.

The regulation for the medical diploma is fixed by Royal Decree dated August 9th, 1910, and is the same for each of the 20 universities and institutes where courses of study are arranged. These are in alphabetical order: Bologna, Cagliari (Sardinia), Camerino, Catania, Ferrara, Florence, Genoa, Messina, Modena, Naples, Padua, Palermo, Parma, Pavia, Perugia, Pisa, Rome, Sassari,[14] Siena, and Turin.

The course covers six years, and embraces the following 20 constituent subjects: (1) experimental physics, (2) inorganic and organic chemistry, (3) botany, (4) zoology and comparative anatomy, (5) normal human anatomy (descriptive or systematic, macroscopic and microscopic), (6) physiology, (7) general pathology, (8) pharmacology and toxicology, (9) pathological anatomy and histology, (10) special medical (practical) pathology, (11) special surgical (practical) pathology, (12) medical clinics, general and special, (13) pediatric clinic, (14) surgical clinic, general, special and operative, (15) obstetric and gynæcological clinic (16) ophthalmological clinic, (17) clinics of nervous and mental diseases, (18) hygiene and public health, (19) legal medicine, (20) dermatological and venereal clinic.

The distribution of these subjects over the six years varies somewhat at the different centres, but the official course at Siena may be taken as an example:—1st year: botany, zoology, normal human anatomy. 2nd year: normal human anatomy, general chemistry, experimental physics, embryology, experimental physiology. 3rd year: normal and topographical human anatomy, experimental physiology, bacteriology, general pathology. 4th year: materia medica, special medical and surgical pathology, pathological anatomy, medical and surgical clinic. 5th year: pathological anatomy, medical, surgical, ophthalmological, and dermatological clinic, hygiene and public health. 6th year: medical, surgical, nervous and mental, pediatrics, and obstetric clinic, legal medicine, operations, history of medical science. Twenty-six optional courses in special subjects can be attended by students of various years. The examinations are held in the latter half of October and June.

Japan.

The medical course is taken at the Imperial Universities of Kyoto and Tokyo, and at the medical schools of Formosa, Aichi, Chiba, Kanazawa, Kumamoto, Nagasaki, Okayama, and Sendai.

The *Kyoto College of Medicine*[15] was established in 1899. It includes institutes of anatomy, physiology, medical chemistry, pharmacology, pathology, hygiene, forensic medicine, medicine, surgery, ophthalmology, gynæcology, pediatrics, dermatology, oto-rhino-laryngology, orthopædic surgery, and psychiatry, each in charge of one or more of the 22 professors and 16 assistant professors, the director being Dr. Hayazo Ito. There is a four years' course of instruction, the first year being devoted to anatomy, histology, physiology, medical chemistry, and embryology. In the second year pharmacology, general pathology, pathological anatomy and histology, diagnosis, special medicine, general surgery, and bandaging are added. The first examination is held at the end of the second academic year, the second at the end of the fourth year in surgery, medicine, ophthalmology, gynæcology, and either hygiene or forensic medicine (the choice being determined by lot). At request students are also examined in pediatrics, dermatology, oto-rhino-laryngology, psychiatry, and orthopædic surgery. In the year 1919 79 students graduated in medicine from the College.

Belgium.

The medical course for the degree of M.D. may be taken at any of the four Universities: Free University of Brussels, State University of Ghent, University of Liége, Catholic University of Louvain. After a preliminary year and an examination which may be taken in two parts—(1) logic, zoology, botany; (2) physics, chemistry, geology—the student becomes "candidat en sciences naturelles." Two years are then devoted to the ancillary sciences, the examination again being in two parts—(1) embryology, systematic anatomy Part I., histology, comparative anatomy, physiology; (2) systematic anatomy Part II., regional anatomy, special histology, psychology, special physiology—when the stage of "candidat en médecine" is reached. Professional studies occupy three years at least, and there are three further examinations. The first includes (i.) general pathology and therapeutics; (ii.) elements of pharmacology and pharmacodynamics; (iii.) pathological anatomy; (iv.) general surgical pathology. The second includes: (i.) medical pathology and special therapeutics, including mental diseases; (ii.) special surgical pathology; (iii.) public and private hygiene; (iv.) the theory of accouchement. The third and final comprises (i.) legal medicine, (ii.) medical clinic, (iii.) surgical clinic, (iv.) operations, (v.) ophthalmological clinic, (vi.) obstetric clinic, as well as practical tests in pathological microscopy and regional anatomy.

The Universities of Ghent and Liége grant a diploma of "médecin-hygiéniste" after examination to medical graduates of at least one year's standing.

University of Liége.—The Faculty of Medicine includes 15 professors and eight lecturers. The dean is Professor L. Fredericq (Institut physiologique). The fee for inscription in the medical faculty is Fr. 200 for the grade of candidate and Fr. 200 for each of the three parts of the professional examination. The Dean of the Medical Faculty is Dr. F. Fraipont. Details of the courses may obtained from Professor Ch. Julin, secretary to the medical faculty.

University of Louvain.—All the courses in the Faculty of Medicine have been resumed. For the third professional examination the programme is as follows: A. Lemaire (medical clinic), R. Schoekaert (theory of accouchement), A. Vander Straeten (ophthalmological clinic), R. Bruynoghe (legal medicine), G. Debaisieux (surgical clinic). L. Van den Wildenberg (oto-rhino-laryngological clinic), A. Van Mosuenck (dental clinic), O. De Mees (minor surgery). The dean of the faculty is Professor Schoekaert, and the secretary Professor Bruynoghe (rue Marie Thérèse 100).

University of Brussels.—The former courses in the Faculty of Medicine were resumed in January, 1919, as well as the clinics at St. Jean and St. Pierre, and the instruction for the diploma of public health.

Details of these courses may be obtained from the secretary of the University at rue des Sols 14, Brussels.

[14] Dean of the Medical Faculty, Professor Ottorino Rossi.

[15] The Kyoto Imperial University Calendar (1919–20) is a volume of 174 pp., published by the University.

HEALTH OF BLACKPOOL.—The annual report for the year 1919 by Dr. E. W. Rees-Jones, medical officer of health for Blackpool, contains interesting observations on social conditions in that town. The infantile mortality rate decreased from 110·5 in 1918 to 96·8 in 1919, while the high general death-rate of 15·5 was considered as still due to the aftermath of war. On the housing question Dr. Rees-Jones says:—

"Basement dwellings constitute one of the most unsatisfactory features in Blackpool, and it is highly desirable that the corporation should have legal powers to prohibit, except by special registration, the use of basements as separate tenements. While some of the front basements in houses facing south might be considered suitable for the purpose, the back basements are very unsuitable, being badly lighted and ventilated. Constant supervision also is necessary to prevent overcrowding and other insanitary conditions arising from the action of the tenants, and 316 visits were paid by the sanitary inspectors."

Dr. Rees-Jones comments on the disadvantages of the production and distribution of milk by private enterprise, and looks forward to the time when the municipality will organise and control the milk-supply.

Correspondence.

"Audi alteram partem."

THE RETURN OF THE DISABLED SOLDIER TO CIVIL LIFE.

To the Editor of THE LANCET.

SIR,—The national scheme for the employment of disabled ex-Service men set out to "secure and maintain the complete absorption of all disabled men into industry." Its achievements have been remarkable, but it is now apparent, after some 18 months, that there remains in the country a residue of disabled men who are unemployable in ordinary industry, "a residue for whom no provision at present exists—namely, those who possess some potential capacity, but could only exercise it if some special arrangements were made for enabling them to do so." (See White Paper 185, p. 9, "Employment.")

Some recent figures, or lack of figures, may throw light upon the extent of the problem of war disablement which has still to be faced.

(1) Wholly disabled, at their homes or in institutions	?
(2) The tuberculous, the epileptic, and blind	?
(3) Still in hospitals	say 60,000
(4) Disabled men still under concurrent treatment and training, shortly to be increased to 4400 (Minister of Pensions, *Times*, August 16th)	2,200
(5) Disabled under training by the Ministry of Labour (Minister of Labour, *Times*, August 12th)...	24,000
(6) Disabled awaiting such training (ibid.)...	21,700
(7) Disabled officers, &c., under training (White Paper, p. 1)	5,000
(8) Disabled, registered as requiring employment (Minister of Labour, House of Commons, July 22nd)	22,000
(9) Disabled already absorbed into industry—	
Officers, &c. (White Paper, p. 1)	9,301
Men (Minister of Labour, *Times*, August 12th) ...	176,000

What is this "residue" referred to in the White Paper? It is made up of a considerable proportion of "seriously injured" who are now registered for employment, together with a large number of men who are from various reasons not so registered. The residue is being continually reinforced from Classes 3, 4, 5, 7, and 9. There must always be a proportion from the large numbers of men who are being absorbed into industry, who break down and return under medical care, and although the disabled men training under the Ministry of Labour (5) are supposed to be fit to work alongside of normal men, experience shows that here, too, a certain proportion break down.

The approximate numbers of the subnormal may be computed from the figures already given and from my own experience of different categories of disablement at the Enham Village Centre. The men at Enham were no doubt rather more disabled than those usually sent to convalescent centres. A few had lost a limb, more were partly paralysed by injuries to limbs. Many others were permanently affected by injuries to the head, either definite wounds or shock, resulting in many forms of disturbance—mental irritability, depression and anxiety, fits and crises of various kinds. Others had been gassed, and remained, at all events for some time, unfit for ordinary work. Others were hampered by heart affections and rheumatism and chronic infections, like malaria and dysentery.

Excluding all who were likely to pass out and take up ordinary employment with a fair hope of success, as well as a small number of men incapable of useful work, I found a remainder, amounting to nearly 20 per cent., whom we placed in a special category as "subnormal." Taking the country as a whole, one subnormal in ten disabled would be a safe minimum estimate. It may well be considerably more. On this basis there cannot be less than 25,000 ex-Service men in the country who are at present unfit for ordinary conditions of industry, but who yet possess a good capacity for work. What is to be their future? Many whom I have seen have shown their keenness by trying work again and again, and have broken down.[1] At present these weakened workers, often of fine character and capacity, have no prospect of employment under the only conditions that are possible for them. The apprehension, depression, and bitterness of mind resulting from such a position can be readily imagined. When they leave the treatment and training centre, or break down after taking employment, they are the despair of the local committees and of the people who are trying to set them on their feet. We must except the fine work being done by the Lord Roberts workshops, where a limited number of men, chiefly injured in the right arm, and therefore unable to compete in the open market, are given permanent paid employment, according to their ability. But these workshops are unfortunately inadequate to deal even with their own class of cases. Following Earl Haig's recent appeal, a certain number of the men we have in mind will probably be given employment by charitable persons, but if experience be any guide it is not likely to be permanent. If to the above 25,000 be added the tuberculous and the epileptic, who are in the same unprovided condition, the total of the subnormal is indeed a disquieting one.

Two recommendations are made by the Parliamentary Committee in the White Paper:—

(1) "That special attention be given to the cases of men who, though not requiring treatment, and therefore not eligible for the convalescent centres, need some form of training or employment in special workshops, or under special conditions, in order to exercise their earning capacity, and that such arrangements be made for them as may be found to be necessary."

(2) "That special attention be given to the desirability of establishing disabled men who have received agricultural training on cottage holdings."

But surely the injured worker must de facto remain an object of medical care, especially in the early stages of employment, and this often means "treatment," mental or physical. He cannot continue in the convalescent centre after his "training" is completed, nor is it advisable that he should do so. His one desire is to be settled, and if married to have his family about him. Treatment must therefore follow him into his new life. As regards (2), it may be of interest to note that in France the existence of this class of subnormal men is a less difficult problem, owing in great measure to the system of land tenure. Investigation shows that the great majority of such men appear to have returned home and to be working on their own small piece of land. They are, as in England, unfit to do a full day's work, either in industry or on the land, but they are perfectly capable of doing their two, three, or four hours a day on their land, thus eking out a slender living with the help of their pensions and their friends. Their health and earning capacity are meanwhile improving under conditions of quiet and freedom from care. The great proportion of these subnormal men in France, as in England, are nerve-strained, and for them such conditions are essential.

What proportion of subnormal men in our country are likely to find their vocation on the land? I should say not more than 1 in 4. The majority either have not the necessary physical strength or the inclination for agriculture or horticulture. Many have their occupations—as printer, colour-etcher, photographer, book-binder, furniture-maker, shoemaker, tailor—and they have no desire to give them up. What they want is the opportunity to carry them on under proper conditions in the country. A man can work at his trade two or three or six hours daily instead of eight, but only in a quiet atmosphere. Given these conditions, his skill is as good as ever. In his spare time we shall find him in his garden or allotment.

Special conditions of life and supervision are obviously needful, not only for the men just described, but for the seriously injured now under training, as well as for the many who are falling out of the ranks of industry. A very clear distinction ought to be drawn between the *temporary* care of disabled men away from their homes in treatment and training centres, and the *permanent* care of the residue of subnormal men with their families

[1] Mr. H. L. Rothband (*Times*, August 21st) quotes the testimony of many large employers that disabled employees are usually anxious for work and are "keener and more conscientious" than the others.

in communities. The first task has been taken over by the Government. The second has yet to be accomplished. Is not this the time for private organisations and friends of the disabled all over the country to coöperate with the Government in organising and administering assisted industries for these weaker brethren? It cannot be done by machinery alone. Much individual care, skilled supervision, and above all the right atmosphere are necessary to give these men a chance, as well as the new special study of the adjustment of vocation to mental and physical capacity. I have seen the power of work return in apparently hopeless cases under the right handling. Many men labelled "subnormal" regain their full earning capacity. Many others will always need the sheltered life.

My experience at Enham has convinced me that all types of partial disablement ought to be mingled together in these village communities, because the interaction of different points of view is favourable to health and morale. And I earnestly hope that the medical service in these communities will include both mental and physical methods of treatment. To the medical profession at this juncture belongs the task of formulating what is needful for this large remnant of weakened and dispirited men, and putting before the public and the Government a remedy for a distressing state of affairs.—I am, Sir, yours faithfully,

London, August 29th, 1920. R. FORTESCUE FOX.

THE TIME OF DAY TO GIVE ANTIMONY TARTRATE FOR BILHARZIA.

To the Editor of THE LANCET.

SIR,—In THE LANCET of August 21st (p. 392) Dr. F. G. Cawston, writing of intravenous injections of antimony tartrate, states:—

"Toxic effects are undoubtedly lessened where the injections are given shortly after a light breakfast, instead of later on in the day. This point has been emphasised by Dr. J. B. Christopherson."

In my article in the *Journal of Tropical Medicine and Hygiene* for July 15th, 1919, I did not exactly say this. I related there that one of the most intelligent of my patients, when injected early in the morning, 9.30 or 10 A.M., found the after-effects to be nil, whereas when the injections were given near lunch time, 12.30 or 1 P.M., he always had giddiness, vomiting, and the reaction generally was severe. "It would therefore appear," I said, "that injections should be given some considerable time, three or four hours, before meal-time." I was referring to natives in the hospital at Khartoum, who breakfast soon after 7 A.M. and lunch at 12–1 P.M.

The question of the best time for making the injections, from the point of view of the condition of the stomach and the digestive processes, is in my opinion a very important one. They should not be given when the stomach is full—for instance, just after a heavy meal—when the blood is largely engaged in the portal circulation with the process of digesting the meal, for, if given then, the toxic, depressing action of the drug will be emphasised, the pulse will possibly be slowed and become weaker, the face pinched and perhaps dusky, the pupils contracted. On the other hand, if given just before a meal, when the patient is depressed and perhaps faint for want of food, the toxic effects of the drug will also be emphasised, especially if a meal be taken directly after. This is shown by a feeling of giddiness, retching, perhaps vomiting, reaction generally. It seems only a matter of common sense that the drug, which has a tendency to depress, should not be given at the time when the patient naturally is depressed. The time of day in itself is not important.

But it is of practical importance, especially when dealing with out-patients, who are not under the same control as in-patients are, to tell them they must not engage in exhausting work previous to nor hurry to be in time for the injection, so that they either have no time for a meal or only time for a hurried scramble of bread and cheese and a glass or two of beer immediately before arrival. Therefore my advice to out-patients is to have a quiet morning. A little necessary work will not matter, but a light digestible meal must be arranged two and a half or three hours before the injection is due. As a light meal I should, for example, advise a basin of good soup with toast or bread, a little fish, and a milk pudding. For a patient in Egypt, the Sudan, or South Africa some corresponding and appropriate food should be taken two and a half or three hours previous to the injection.

It is by attention to details such as these that success is to be attained.—I am, Sir, yours faithfully,

August 24th, 1920. J. B. CHRISTOPHERSON.

GENERALISED HERPES OR CHICKEN-POX?

To the Editor of THE LANCET.

SIR,—The recent discussion in THE LANCET upon herpes and chicken-pox suggested that a case at present under my care may be of general interest.

My patient, a man 80 years old, spent four hours in the open air watching a cricket-match on June 26th. The next day he was suddenly seized with an acute pain over the outer side of the left leg, with definite tenderness along the course of the external popliteal nerve. I treated him for neuritis, but on June 28th his pain was only slightly less severe. On June 29th I noticed several small papules evenly distributed over the trunk, extending to the shoulders, arms, and back of both thighs. There was no rash on the face, forearms, or legs. The next day the rash had mostly become vesicular, but new papules had appeared with the same distribution with the addition of some over both legs. Over the outer side of the left leg there was also a fairly well marked erythema, which I then attributed to the effect of the liniment. Apart from this erythema, the appearance was indistinguishable from that of chicken-pox of moderate severity. On July 1st an intense herpetic eruption appeared on the left buttock and leg in two well-marked lines, corresponding probably to the cutaneous sacral nerves, and over the sole of the left foot in a single well-marked line corresponding to a possible cutaneous branch of the internal plantar nerve. The whole of the left leg was now painful, but the acute pain at the orginal site had diminished.

There was no doubt that the patient was now suffering from an attack of herpes zoster, and I recalled a paper by Dr. Cranston Low[1] on the possible association of varicella and herpes zoster. Six weeks after onset the patient still bears pitted marks, still complains of occasional shooting pains and hyperalgesia over the region of distribution. I must mention that previous to the onset of this illness, and commencing on June 14th last, the patient took in all half a drachm of liq. arsenicalis in ♏ 2 doses three times daily after food as a general tonic. I cannot obtain any history of a previous attack of chicken-pox or shingles.

At present the question in my mind is whether this case has been one of varicella associated with herpes or one of "herpes zoster generalisatus," as described by Dr. Low.—I am, Sir, yours faithfully,

STEWART MCNAUGHTON, M.D. Edin., D.P.H. Camb., &c.,
Honorary Physician, Monkwearmouth Hospital.

Sunderland, August 17th, 1920.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments have been made:—Surgeon Commanders: R. L. Jones to *Chatham;* P. H. Boyden to *President*, additional, for Porton Experimental Station; J. R. Muir to R.N. Hospital, Haslar; and R. H. McGiffin to *Raleigh*. Surg. Lieut.-Cmdr. W. H. Murray to R.N. Hospital, Gibraltar. Surg. Lieut. W. J. Colborne to 3rd R. M. Batt., Eastern Mediterranean.

Surg. Cmdr. H. W. Finlayson is placed on the Retired List and granted the rank of Surgeon Captain.

ARMY MEDICAL SERVICE.

Major W. Davis relinquishes acting rank of Lieutenant-Colonel.

Temp. Capt. D. C. McCabe-Dallas relinquishes acting rank of Major.

Capt. J. M. Macfie to be acting Major.

Temp. Major G. S. Simpson (Captain, R.A.M.C., T.F.) relinquishes his temporary commission on re-posting.

Capt. F. Holmes, from Spec. Res., to be Lieutenant and to be temporary Captain.

Temp. Major A. L. B. Green (Major, 1st Hereford R., T.F.) relinquishes his temporary commission.

Capt. H. J. Bensted to be temp. Major whilst specially employed.

The undermentioned to be temporary Captains: D. E. Hearn (late Captain, R.A.M.C., Spec. Res.), J. D. Judson (late temporary Captain), and H. H. McClelland (late temporary Captain).

Major-Gen. Sir H. N. Thompson, half-pay list, retires on retired pay.

[1] Brit. Med. Jour., Jan. 25th, 1919.

Temp. Lieut.-Col. T. S. Good relinquishes his commission on ceasing to be employed at the Ashurst War Hospital, and retains the rank of Lieutenant-Colonel.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. H. W. K. Read, and Majors E. G. Ffrench (granted the rank of Lieutenant-Colonel), T. F. Ritchie retire on retired pay.

Temp. Capts. S. H. Pitcairn and J. L. Wilson relinquish the acting rank of Major.

Capt. D. Fettes (late temporary Captain, R.A.M.C.) and Temp. Capts. J. McP. MacKinnon and H. S. Moore to be Captains.

Temp. Capt. M. F. D. Graham to be Lieutenant and to be temporary Captain.

Lieut. A. M. Simson, from T. F. Res. (Art.), to be Lieutenant.

Officers relinquishing their commissions:—Temp. Capts. R. J. Monahan, M. J. Wilson, C. A. B. Horsford, E. C. Arnold, H. H. Perry, H. C. Sutton, W. L. G. Anderson, J. M. MacPhall, P. Johnson retain the rank of Captain.

SPECIAL RESERVE OF OFFICERS.

Officers relinquishing their commissions: Major H. G. Smeeth. Capt. R. E. Grandy, Capt. G. A. MacDonald (retains the rank of Captain). Capts. (granted the rank of Major) W. F. Wood, R. P. Starkie, S. J. V. Furlong, R. Taylor. Capts. (retaining the rank of Captain) A. B. Dummere, W. R. McLinden, R. R. Traill, M. Morrison, D. C. Rennie, W. McWilliam, H. L. Addison, H. J. Duske, T. L. Crawhall, A. Dick, T. B. Moyes, F. J. Harvey, S. Adler, C. Young, Capt. A. A. Atkinson, F. Bignold, F. Randall, I. Evans. Lieut. A. Kennedy (retains the rank of Lieutenant).

Capt. A. Bulleid relinquishes the acting rank of Major.

GENERAL RESERVE OF OFFICERS.

Capt. H. J. Bower resigns his commission and retains the rank of Captain.

TERRITORIAL FORCE.

Capt. E. Scott (late temporary Captain, R.A.M.C.) to be Captain.

Capts. (acting Majors) M. Brennan, W. A. Brechin, and A. Cameron relinquish their acting rank on ceasing to be specially employed.

Officers relinquishing their commissions:—Major E. Turton and Capts. J. H. Peyton and C. S. Young are granted the rank of Lieutenant-Colonel.

Capts. J. Arthur, A. Oliver, W. Scott, D. M. Spring, T. W. Hancock, C. H. Bullen, and G. M. McGilivray are granted the rank of Major.

Capt. F. A. Pring resigns his commission.

Captains retaining the rank of Captain: J. E. Ransford, F. Ryan, S. Simpson, J. Fenton, H. W. Kerrigan.

Col. W. Ranson vacates the appointment of Assistant Director of Medical Services, East Lancs. Division.

Lieut.-Col. (Bt. Col.) F. H. Westmacott, from 2nd Western General Hospital, to be Colonel and Assistant Director of Medical Services, East Lancs. Division.

Capt. A. G. Wilson, from 3rd Northern General Hospital, to be Captain.

Capt. G. Eager (late temporary Captain, R.A.M.C.) to be Lieutenant, and to relinquish the rank of Captain.

Capt. J. G. Morrin (late temporary Captain, R.A.M.C.) to be Captain.

4th London General Hospital: Capt. A. J. Jex-Blake resigns his commission and is granted the rank of Major.

4th Northern General Hospital: Major W. E. F. Tinley resigns his commission and retains the rank of Major.

2nd Western General Hospital: Capt. J. Wharton resigns his commission and retains the rank of Captain.

2nd Eastern General Hospital: Capt. H. H. E. Scatliff resigns his commission and retains the rank of Captain, with permission to wear the prescribed uniform.

3rd Southern General Hospital: Capt. F. Clarke is restored to the establishment.

TERRITORIAL FORCE RESERVE.

Capt. H. G. L. Haynes to be Lieutenant-Colonel.

Major A. E. Hodder resigns his commission, and is granted the rank of Lieutenant-Colonel.

ROYAL AIR FORCE.

Medical Branch.—The undermentioned are transferred to unemployed list: Capts. W. G. Weston, J. D. Cherry, M. C. Breese, D. Cromie, Lieut. A. Wilson.

INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lieut.-Col. W. H. E. Woodwright.

DECORATIONS.

Mr. E. S. Crispin, Director of the Soudan Medical Department and a Member of the Governor-General's Council, and Dr. A. F. Macallan, of the Ophthalmic Hospital, Egyptian Department of Public Health, have been appointed Commanders, and Dr. J. A. Clark, of the Medical Service of the Egyptian Army, has been appointed a Member of the Civil Division of the Most Excellent Order of the British Empire for services rendered in Egypt and the Soudan.

American.

Distinguished Service Medal.—Maj.-Gen. Sir W. B. Leishman, K.C.M.G., C.B., F.R.S., K.H.P.

Belgian.

Croix Civique.—1st Class: Lt.-Col. S. de C. O'Grady, C.M.G., D.S.O., R.A.M.C.

French.

Médaille de l'Assistance Publique.—"En Argent": Temp. Capt. H. O. Gough, R.A.M.C.; Lt.-Col. H. MacCormac, C.B.E., late R.A.M.C. *"En Bronze":* Temp. Capt. H. M. Agnew, R.A.M.C.; Temp. Capt. M. Eager, R.A.M.C.; Temp. Maj. T. N. Frood, R.A.M.C.; Temp. Capt. F. A. Ross, R.A.M.C.

Roumanian.

Order of the Crown of Roumania.—"Chevalier": Temp. Capt. M. Eager, R.A.M.C.

Medical News.

UNIVERSITY OF CAMBRIDGE.—The following have been reappointed Demonstrators: Biology, Mr. H. H. Brindley, St. John's; Animal Morphology, Mr. J. T. Saunders, Christ's; Comparative Anatomy, Mr. J. Gray, King's.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—L. Burvill-Holmes (Sects. I. and II.), Guy's Hosp.; M. C. Hartley (Sects. I. and II.), London Hosp.; H. Morris (Sect. I.), St. Bart.'s Hosp.; J. W. E. Ord (Sects. I. and II.), McGill; A. C. D. Telfer (Sects. I. and II.), St. Bart.'s Hosp.; and C. M. Tinkler (Sects. I. and II.), Liverpool.

Medicine.—J. A. Cohen (Sects. I. and II.), King's Coll. Hosp.; M. C. Hartley (Sects. I. and II.), London Hosp.; R. E. Jenkins (Sects. I. and II.), Charing Cross Hosp.; W. A. O'Connor (Sect. II.), Oxford and Birmingham; J. W. E. Ord (Sects. I. and II.), McGill; A. C. D. Telfer (Sects. I. and II.), St. Bart.'s Hosp.; and C. M. Tinkler (Sects. I. and II.), Liverpool.

Forensic Medicine.—B. C. Betts, Manchester; A. Y. Cantin, London Hosp.; J. E. Delicati, Bristol; M. C. Hartley, London Hosp.; W. A. O'Connor, Oxford and Birmingham; J. W. E. Ord, McGill; A. C. D. Telfer, St. Bart.'s Hosp.; C. M. Tinkler, Liverpool; and J. Solomonoff, London Hosp.

Midwifery.—A. Y. Cantin, London Hosp.; W. H. Cellier, Guy's Hosp.; R. Erskine Gray, Charing Cross Hosp.; C. T. Gasking, Liverpool and Sheffield; M. C. Hartley, London Hosp.; W. A. O'Connor, Oxford and Birmingham; J. W. E. Ord, McGill; J. Sullaiman, Guy's Hosp.; A. C. D. Telfer, St. Bart.'s Hosp.; and E. W. Terry, Manchester.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: L. Burvill-Holmes, A. Y. Cantin, M. C. Hartley, R. E. Jenkins, J. W. E. Ord, W. A. O'Connor, and A. C. D. Telfer.

Lord Southborough has been appointed chairman of the War Office Departmental Committee to inquire into the relation between shell shock and the death sentences for alleged cowardice in the earlier part of the war with a view to guidance in the future (see THE LANCET, May 8th, p. 1033, Parliamentary Intelligence).

RADCLIFFE INFIRMARY, OXFORD.—A post-graduate course will be held from Oct. 1st to 9th, which will include demonstrations of operations, medical cases, and cases in special departments in the mornings, whereas in the afternoon papers will be read by specialists of distinction, among whom will be the Regius professor, Sir Archibald Garrod, and Professor G. Dreyer. A dinner will be held in Queen's College Hall on Tuesday, Oct. 5th, at 7.30 P.M. (morning dress). The price of tickets is 15s., including wines, and they will be issued to those applying not later than Oct. 1st to Dr. Hugh Whitelocke, secretary to the committee, Radcliffe Infirmary, Oxford.

UNIVERSITY OF SHEFFIELD.—The University has recently founded a whole-time chair of pharmacology to which Dr. Edward Mellanby, at present professor of physiology in the University of London, has been appointed. Professor Mellanby has also been elected honorary physician to the Royal Infirmary in the place of Dr. W. S. Porter, who has resigned after 30 years' service. This direct connexion between the experimental study of pharmacology in the University and its clinical application to the treatment and investigation of disease offers a fruitful field for progress in this branch of medicine, and should lead to important results. Another interesting step is the appointment of Dr. J. B. Leathes, F.R.S., professor of physiology in the University, as honorary physiologist to the Royal Infirmary and the Royal Hospital. By arrangement between the University and the clinical institutions Professor Leathes and his assistants will have charge of clinical laboratories there, and will be responsible for all the chemico-physiological work required by the clinicians. From the point of view of clinical medicine this arrangement should prove of the highest value, and on the student's side it is a first step in the scheme evolved by the Faculty of Medicine to bridge over the gap between the early laboratory years and the later clinical stages of the student's curriculum. In outline this scheme consists (1) in holding the Second M.B. at the end of the second year in general anatomy and physiology; (2) in beginning clinical work in the third year, and continuing applied anatomy and physiology during the third and fourth years as subjects upon which, together with pathology and pharmacology, the student will be examined in the Third M.B. at the end of the fourth winter. Students will thus, during the middle third of their career, be doing clinical hospital practice and laboratory work in applied subjects simultaneously. It is hoped by this means to impress upon them that there are such sciences as anatomy and physiology of the living, upon which ultimately depend medicine, surgery, and pathology

JOINT HOSPITAL ADVISORY COUNCIL IN SHEFFIELD.—About a year ago the governing bodies of the four voluntary hospitals in Sheffield agreed to the formation of a Joint Consultative and Advisory Council, consisting of representatives of the boards and staffs of the Royal Infirmary, the Royal Hospital, the Jessop Hospital for Women, and the Hospital for Sick Children, together with representatives of the University, the Edgar Allen Institute for Medico-mechanical Treatment, and of the trades organisations of the city. The Lord Mayor is ex-officio President, and the Vice-Chancellor of the University (Sir Henry Hadow) was appointed chairman. The functions of the Council are, as indicated by its title, of a consultative and advisory character only, and although it has no direct control over any of its constituent bodies, it has already proved its value in bringing together all these hitherto distinct institutions, and enabling joint action to be taken in various matters of hospital policy submitted for its consideration. Many important questions have been investigated, and the Council is likely to prove of increasing utility in dealing with the difficulties with which all voluntary hospitals are faced. In Sheffield, as elsewhere, the immediate need of the voluntary hospitals is for increased funds to meet current expenses, and this subject is having the careful consideration of the Council.

THE Ministry of Agriculture is arranging to employ obsolete battleships as floating laboratories for the investigation of foot-and-mouth disease.

POST-GRADUATE LECTURES FOR PANEL DOCTORS.—The following post-graduate lectures will be held this autumn under the auspices of the London Panel Committee: A course on Laboratory Methods in the Prevention, Diagnosis, and Treatment of Disease will be given by Dr. W. W. C. Topley at Charing Cross Hospital on Thursdays at 4 P.M. (date to be announced later); and a course on Venereal Diseases, by Colonel L. W. Harrison, will be held at St. Thomas's Hospital commencing Thursday, Sept. 23rd, at 4 P.M. The fee for each course will be £3 3*s*., payable to the secretary of the Panel Committee at Staple House, 51, Chancery-lane, London, W.C.2, who will forward cards of admission.

ANNUAL DINNERS OF THE MEDICAL SCHOOLS.—For the convenience of past students of those of the London medical schools which are holding annual dinners in early October we append the following details as far as we have hitherto received them:—

St. Bartholomew's Hospital old students' annual dinner will be held on Friday, Oct. 1st, at 6.30 P.M. for 7 P.M. in the Great Hall of the Hospital. Sir Anthony Bowlby will preside. The honorary secretary is Sir C. Gordon Watson, 82, Harley-street, London, W. 1.

Charing Cross Hospital Medical School annual dinner of past and present students will be held on Monday, Oct. 4th at 7 for 7.30 P.M., at the Adelaide Gallery, Gatti's Restaurant. Dr. J. Mitchell Bruce will take the chair. Past students requiring tickets are requested to write to the dean of the school.

St. George's Hospital Medical School annual dinner is to be held at Prince's Restaurant, Piccadilly, at 6.30 for 7, on Friday, Oct. 1st. Sir Humphry Rolleston will preside, and the honorary secretaries are Mr. Ivor Back and Dr. Claude Frankau.

King's College Hospital past and present students' dinner will be held on Friday, Oct. 1st, at 7 for 7.30 P.M., at the Criterion Restaurant, Piccadilly-circus, W. Dr. Philip Boobbyer will preside. Applications for tickets (price 15*s*., exclusive of wine) should be sent to the honorary secretaries, King's College Hospital.

St. Mary's Hospital annual dinner of past and present students will be held on Friday, Oct. 1st, at the Connaught Rooms, Great Queen-street, London, W.C., at 7 for 7.30 P.M. Sir John Goodwin will preside. Tickets (price 12*s*. 6*d*., exclusive of wine) can be obtained from the honorary secretary, Mr. V. Warren Low, 76, Harley-street, London, W. 1.

Middlesex Hospital Medical School annual dinner will be held on Friday, Oct. 1st, at 7.30 P.M., at the Wharncliffe Rooms, Great Central Hotel, Dr. R. A. Young in the chair. Those wishing to be present should communicate as soon as possible with the secretary-superintendent of the hospital.

Westminster Hospital old students' dinner will be held on Thursday, Sept. 30th, at the Imperial Restaurant, Regent-street, at 7.30 P.M. Lord Glenconner will be in the chair and the honorary secretary is Dr. Adolphe Abrahams.

University College Hospital Medical School annual dinner of old students will be held at the Imperial Restaurant, Regent-street, on Friday, Oct. 1st, at 7 for 7.30 P.M. Professor Harry Littlewood will preside. Tickets, price 15*s*. (not including wine), may be obtained from the honorary secretaries, Dr. A. M. H. Gray and Mr. Gwynne Williams, 30, New Cavendish-street, London, W. 1.

MANCHESTER ROYAL INFIRMARY: OLD RESIDENTS' DINNER.—A notice of this dinner, which will take place on Oct. 9th, has been sent out to all members of the Old Residents' Club. Any members who have failed to receive one are asked to communicate with the honorary secretaries at the Royal Infirmary, Manchester.

HOSPITAL CONDITIONS IN MANCHESTER.—It is calculated that the expenditure on Manchester hospitals last year exceeded the income by about £30,000. The Manchester Royal Infirmary had a deficit of over £17,000, which, however, was considerably lessened by an opportune donation. The Ancoats Hospital had an overdraft of £9000, and the St. Mary's Hospitals for Women and Children a deficit on the year's working of nearly £7000. The Salford Royal Hospital is also spending £7000 more than its annual income.

INSTRUCTION IN HOSPITAL ADMINISTRATION.—A three months' course of lectures and demonstrations in hospital administration will be given at the Western Hospital, Seagrave-road, Fulham, S.W., by Dr. R. M. Bruce, on Tuesdays and Fridays, at 5 P.M., beginning Tuesday, Sept. 28th. Medical men desiring to attend should pay the fee for the course (£3 3*s*.) to the Clerk to the Metropolitan Asylums Board, Embankment, E.C., giving their full name and address, before the course begins.

A REPORT issued this week by the Commissioner of the Metropolitan Police shows that 688 persons were killed in street accidents in the metropolitan area during the year 1919, an increase of 76 over the fatal accidents of 1918. Of the total, private motor-cars accounted for 138 and motor-buses for 136. Tramcars, cabs, and motor-cycles were far behind with 42, 26, and 25 fatalities respectively.

SOCIETY FOR THE STUDY OF INEBRIETY.—A meeting of this society will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-street, W., on Tuesday, Oct. 12th, at 4 P.M., when, after consideration of the revised rules and by-laws submitted by the Council, Dr. James A. Davidson will open a discussion on "Special Clinics for Inebriates." Each member and associate is at liberty to introduce visitors. Subscriptions for the session and donations should be forwarded to the honorary treasurer, Mr. Arthur Evans, at 28, Devonshire-place, London, W. 1.

THE DANGEROUS DRUGS ACT.—It is announced that from Sept. 1st the import and export of opium, medicinal opium, morphia, diamorphine (heroin), cocaine, and ecgonine are prohibited except under licence of the Secretary of State. Applications for licences to import any of these drugs should be addressed to the Under Secretary of State, Home Office, Whitehall, London, S.W. 1, while applications for export licences should be addressed to the Board of Trade (Imports and Exports Department), Great George-street, London, S.W. 1. The import and export of raw opium will only be allowed through the ports of London and Liverpool, and all packages for export which contain raw opium must be marked in a certain manner. The import, export, manufacture, sale, or possession of opium prepared for smoking is absolutely prohibited. Regulations for controlling the manufacture, sale, possession, and distribution in the United Kingdom of the above-mentioned drugs are being prepared and will be issued shortly. Pending the issue of these regulations the restrictions on dealings in opium and cocaine and on the manufacture of cocaine imposed by Defence of the Realm Regulation 40b will continue in force.

THE Joint Committee of the British Red Cross and St. John of Jerusalem have issued a leaflet setting out the needs and aims of the joint societies. They hope to collect £1,000,000 a year for the continued care of sick and wounded soldiers; for maternity, infant, and child welfare work; for the erection and maintenance of sanatoriums; the extension of the motor ambulance service and the peace library; materials for work parties for hospitals and welfare centres; and other benevolent purposes. "Our Day" is fixed for Thursday, Oct. 14th, when a special effort will be made to raise funds in commemoration of the amalgamation of the British Red Cross Society and the Order of St. John. During October and November effort will be made to collect funds for helping ex-soldiers and sailors still in need of treatment, for assisting the home civil hospitals and curative institutions, and for extension of the home ambulance service and peace library. It is hoped that the collections on one Sunday—Nov. 14th is suggested—throughout the kingdom will be donated to the joint societies, and an appeal to this effect has been signed by the Archbishops of Canterbury and York, Cardinal Bourne, and the heads of all the Free Churches. The amount from these Sunday collections will be shared with the Imperial War Relief Fund, which is dealing with the typhus scourge of Central Europe.

THE late Dr. David James Williams, of Llanelly, left £250 to the Llanelly Hospital for the better equipment of the operating theatre.

THE freehold of the Throat Hospital in Golden-square is being offered for sale with a view to the rebuilding of the hospital on a less costly site.

Dr. E. Roux, president of the Superior Council of Hygiene and director of the Pasteur Institute, has been awarded the Grand Cross of the Legion of Honour.

Mr. Robert Dunstan, M.R.C.S., L.R.C.P., barrister-at-law, has been appointed deputy coroner for the North-Eastern District of the County of London.

Dr. A. D. Cowburn, acting deputy coroner for North-East London, has been appointed deputy coroner for the South-Western district of London and the City of Westminster.

ON relinquishing his practice at Northwood on account of health, Dr. R. E. Humphry was the recipient of a presentation from his old patients. Dr. Humphry was surgeon in charge of No. 67 General Hospital at Salonika.

LITERARY INTELLIGENCE.—The *Clinical Journal*, founded in 1892 with the object of specially reporting and publishing clinical lectures given by leading physicians and surgeons of the day, has now resumed its weekly appearance. Messrs. H. K. Lewis and Co. are now responsible for publication and propose to include in it short notices of books likely to interest the general practitioner. The subscription price of the journal is 28*s*. 6*d*. a year, post free.

THE LATE DR. HENRY SHACKLETON. — Dr. Shackleton died at Sydenham, at the age of 73, on August 26th. Born at Moone, co. Kildare, in 1847, he only took up medicine comparatively late in life, and qualified M.D. Dub., M.R.C.S. Eng., and L.M.K.Q.C.P. Irel. in 1884. He practised at Sydenham for over 30 years, retiring about four years ago. Dr. Shackleton was the father of the distinguished explorer.

MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE SOCIETY, LTD.—The first general meeting of this society took place on August 23rd, three months after the conversion of the friendly society into a company. The chairman expressed regret at having to call a meeting of the members during the holiday season, but according to the memorandum of the company, it is necessary to hold a meeting at the end of three months after the incorporation. The conversion had been carried through quite smoothly. Only 21 members of the old society declined to become members of the company, and most of these were bordering on the age of 65, and therefore just about to sever their connexion with the society. Since conversion considerable progress had been made in all departments. The life assurance business had moved forward with a considerable boom, and in two and a half months proposals had been received for over £10,000. The sickness insurance had also considerably increased, proposals being received for 390 guineas. Dr. J. B. Ball, who acted as medical examiner for the society for a number of years, decided, on conversion, to resign his office owing to his advancing years. Dr. David Forsyth had been appointed as his successor. He was one of the original directors, but resigned on his appointment as medical examiner.

DOCTORS THREATENED AT CORK PRISON.—According to the Belfast *News Letter*, a threatening letter was received by the two medical officers sent by the Government to Cork prison for medical attendance on 11 prisoners hunger-striking there. The officers were Dr. C. J. MacCormack, a medical member of the General Prisons Board, and Dr. J. I. Kinsella, medical officer to the convict prison at Maryborough. The letter was signed C. Cork Brigade, I.R.A., and ran as follows:—

This is to notify you that we hold you responsible for the lives of the men at present on hunger-strike in Cork jail, and should any of them die there in jail, or after release, you will be guilty of death under the laws of the Republic. If you disclaim responsibility for the present treatment of these men, you can make this fact public by sending a notice of your resignation to the press to-night. This is the only action that will save you should a single prisoner under your charge die.

The Dublin Castle authorities gave it clearly to be understood that the two medical men went to Cork Prison under orders from the Government, and that as soon as they had examined the prisoners thus placed under their medical care they strongly recommended to the Government that on medical grounds the prisoners should be released. The statement concludes: "The responsibility of Dr. MacCormack and Dr. Kinsella is confined to taking such steps as are within their competence as medical men to relieve the condition to which the prisoners have been reduced by their own act."

RABIES IN WILTSHIRE.—In consequence of the occurrence of several cases of rabies in the neighbourhood a "dangerous" area has been proclaimed having a radius of about five miles round Salisbury and Wilton. A larger area with muzzling restrictions includes parts of Wilts, Hants, Dorset, and Berks.

SMALL-POX IN SCOTLAND.—474 cases of small-pox have been reported to date in the Glasgow district and the outbreak is becoming more evenly distributed throughout the city. Vaccination is stated to be falling off. Two cases were reported in Edinburgh last week-end.

CLOSING OF WHARNCLIFFE WAR HOSPITAL.—After more than five years' service as a military hospital under Lieutenant-Colonel W. J. N. Vincent, the South Yorkshire Asylum at Wadsley has been demobilised and reverts once more to its original duties as an asylum. One large block of buildings, however, remains a hospital for pensioners, and it is intended that all the sick pensioners in the district shall be treated there. This arrangement sets free the two wards at the Royal Hospital, which have for some months been used for pensioners in connexion with the Orthopædic Fund Committee. A large number of men still receive medico-mechanical treatment at the Edgar Allen Institute, which, under the direction of Dr. R. G. Abercrombie, has proved of great value in this work during and since the war.

ROYAL HANTS COUNTY HOSPITAL, WINCHESTER.—A special appeal is being made throughout Hampshire on behalf of the County Hospital, Winchester, to obtain a sum of £6000 to pay off the overdraft due to the bankers. Sir Shadforth Watts has promised a contribution of £1000 provided the whole of the debt is paid off. The committee has resolved that the work of the hospital in future must be so conducted as to make the expenditure conform to the revenue. To carry out this policy one ward has been closed, and a scheme is being formulated with the assistance of the trade-unions whereby every wage-earner, man and woman, will be urged to contribute a small weekly sum to the hospital. In-patients are asked to contribute towards the cost of their food as far as their means permit.

Obituary.

PHILIP JOHN HENSLEY, M.D. CAMB. & DURH., F.R.C.P.,

CONSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

Dr. Hensley, who died at Shortheath, Farnham, on August 8th, was in his eighty-second year, and had lived long in retirement. He came up to London with a brilliant record from Christ's College, Cambridge, where he passed high as a wrangler. After qualifying M.B. Camb. in 1867 he early reached the position of house physician to St. Bartholomew's Hospital, and began to demonstrate physics in the medical school. He was a careful and minute observer, and an early contribution to the *Hospital Reports* was a mathematical demonstration of the exactitude of Sir William Roberts's yeast process for determining the amount of sugar in the urine. The same traits followed him into the out-patient department and the wards of the hospital, where his exact teaching was attractive to his clinical clerks. His lectures on forensic medicine contained sound substance and interesting detail, but were rendered unacceptable to students by an unfortunate defect of elocution. Hensley was no specialist in the narrow sense, but his knowledge of pulmonary diseases was such that cases from his clinic which led to an autopsy amply supported his diagnosis. At this time he was also physician to the Royal Hospital for Diseases of the Chest. Elected F.R.C.P. in 1871, Hensley was Goulstonian lecturer in the following year; he became Councillor in 1895, and Censor for the two years 1898–99. At the time of his death there were only five Fellows senior to him. In person Dr. Hensley was singularly modest and self-effacing, and of even temper. He married rather late in life a devoted wife, an accomplished painter in water-colours, and thus had to relinquish his Fellowship at Christ's College. He had no family, and his wife predeceased him. He retired from London after a full service at the hospital, taking with him the esteem of his colleagues, and much missed by all who understood his worth and appreciated his powerful intellect and sweetness of character.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Sept. 6th.—2 P.M., Dr. G. Stewart: Medical Out-patients. 2 P.M., Mr. D. Armour: Operations.

TUESDAY.—2 P.M., Dr. Burnford: Medical Out-patients. 2.30 P.M., Mr. Addison: Visit to Surgical Wards.

WEDNESDAY.—10 A.M., Dr. A. Saunders: Medical Diseases of Children. 2 P.M., Mr. Gibb: Eye Department.

THURSDAY.—2 P.M., Mr. D. Armour: Operations. 2 P.M., Mr. Sinclair: Orthopædic Department.

FRIDAY.—10 A.M., Mr. D. Buxton: Dental Department. 2 P.M., Mr. Banks Davis: Diseases of the Throat, Nose, and Ear.

SATURDAY.—10 A.M., Dr. A. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients.

Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.

MONDAY, Sept. 6th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

JOLL, CECIL A., M.S., M.B., B.Sc. Lond., has been appointed Surgeon to the Royall Free Hospital, and Consulting Surgeon to Royal Bucks Hospital, Aylesbury.

MULLALLY, G. T., M.C., M.S., F.R.C.S., Assistant Surgeon to the Westminster Hospital.

Certifying Surgeons under the Factory and Workshop Acts: WALKER, A. (Cardenden); WALLS, J. A., M.B., Ch.B. Glasg. (Bothwell); GILES, A. C., M.B., Ch.B. Edin. (Sleaford); BLAKE, V. H., M.B., B.S. Lond. (Great Yarmouth).

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £250.
Battersea General Hospital (Incorporated), Battersea Park, S.W.—Third Res. M.O. £200.
Bedford County Hospital.—Asst. H.S. £150.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—Asst. P. 50 gs. Also Female H.S. £100.
Bengal, University of Dacca.—Chair of Physical Education. Rs. 9000 to Rs. 12,000.
Birmingham City, Salterley Grange Sanatorium for Consumptives.—Res. M.O. £550.
Birmingham General Hospital.—Surg. Registrar. £200.
Bootle County Borough.—Tuberc. O. and Dep. M.O.H. £750.
Bradford Royal Infirmary.—H.S. £200.
British Guiana.—Asst. M.O.H. £600.
Bristol General Hospital.—Two H.P.'s, H.S., and Obstet. O. and H.S. £175 each.
Cancer Hospital, Fulham-road, S.W.—Asst. P. and Med. Reg. £250. Also Two H.S.'s. £150.
Cardiff, King Edward VII. Welsh National Memorial Association.—Asst. Tuberc. P.'s, £500.
Central London Throat and Ear Hospital, Gray's Inn-road, W.C.—Registrar.
Chester County Asylum.—Third Asst. M.O. £350.
Chester Royal Infirmary.—H.S. £200. Also H.P. £175.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £100.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Devonport, Royal Albert Hospital.—H.S. £200.
Durham County Council.—Female Asst. Welfare M.O. £600.
Durham University, College of Medicine, Newcastle-upon-Tyne.—Lecturer on Med. Jurisprudence.
East Africa.—M.O. to C.M.S., Kavirondo.
Edinburgh Royal Infirmary.—Asst. Path., Asst. Clin. Path. £500 each. Also Second Asst. Clin. Path. £350.
Exeter, Royal Devon and Exeter Hospital.—Surg. Reg. Asst. M.O. in Electrical Treatment Dept.
Great Northern Central Hospital, Holloway-road, N.—H.P. £150.
Huddersfield Royal Infirmary.—Asst. H.S. £150.
Hull and Sculcoates Dispensary.—M.O. £500.
Hull Royal Infirmary.—Asst. H.S. £150.
Ingham Infirmary and South Shields and Westoe Dispensary.—Jun. H.S. £175.
Kensington Board of Guardians.—Fourth Asst. M.O. £250.
Kent Education Committee.—Sch. Med. Inspec. £562.
Liverpool Dispensaries.—S. £300.
London Lock Hospital, Soho, W.—Hon. S.
London Temperance Hospital, Hampstead-road, N.W.—H.P. £120.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Manchester, Ancoats Hospital.—Anæsth. 10*s.* 6*d.* per attendance Also Res. Surg. O. £250.
Manchester Royal Eye Hospital.—H.S. £120.
Manchester Royal Infirmary, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £300.
Manchester Royal Infirmary, Central Branch, Roby-street.—Res. M.O. £250.
Manchester and Salford Hospital for Skin Diseases.—H.S. £100.
Margate, Royal Sea Bathing Hospital.—Res. S. £200.
M.A.B., Colindale Hospital, Hendon, N.W.—Sen. Asst. M.O. £645 5*s.* Also Jun. Asst. M.O. £515 6*s.*
Metropolitan Hospital, Kingsland-road, E.—Cas.O. and Res. Anæsth. £120. Also Asst. H.S. and Asst. H.P. £100 each.
Middlesex County Council, Harefield Sanatorium.—Res. Med. Supt. £700.
Ministry of Health.—Asst. Bacteriologist. £300.
Ministry of Health, Welsh Board of Health.—M.O.'s. £600.
National Hospital for the Paralysed and Epileptic, Queen-square, Bloomsbury, W.C.—Registrar. £200. Also Sen. H.P. £150.
Newport, Mon., Education Committee.—Female Asst. Sch. M.O. and Med. Inspec. of Sch. £500.
Nottingham.—Asst. to City Pathologist. £500.
Preston and County of Lancaster Royal Infirmary.—H.S. and H.P. £180 each.
Reading, Royal Berkshire Hospital.—H.P. and Second H.S. £200 each.
Royal Chest Hospital, City-road, E.C.—Asst. M.O. £450.
Scarborough Hospital and Dispensary.—Two H.S.'s. £150.
Scottish Board of Health.—Dist. M.O.'s. £1000.
Sheffield Royal Hospital.—Asst. Cas. O. £150.
Sheffield Royal Infirmary.—H.P. and H.S. for Ear, Nose and Throat £150 each.
Sheffield University, Department of Pathology and Bacteriology.—Director. £800. Asst. Director. £500. Curator of Path. Museum. £600.
South London Hospital for Women, South Side, Clapham Common, S.W.—Female Asst. S. Also Clin. Assts.
Stafford, Staffordshire General Infirmary.—H.P. £200.
St. Mary's Hospital, Paddington, W.—Med. Supt. £350.
Sudan Medical Department.—M.O. £840.
Sunderland Royal Infirmary.—Jun. H.S. £200.
Taunton and Somerset Hospital.—Jun. H.S. £150.
Uganda.—M.O. to C.M.S. Mengo Medical School.
Union Mental Hospital Service, South Africa.—Jun. Asst. P.'s. £400.
University of London.—Prof. of Med. and Director of Med. Clin. £2000.
Ventnor, Isle of Wight, Royal National Hospital for Consumption and Diseases of the Chest.—Asst. Res. M.O. £300.
Westmorland Sanatorium and Home, Meathop, Grange-over-Sands.—Res. Asst. M.O. to the Westmorland Sanatorium and Asst. Tuberc. O. for Westmorland. £350.
Wolverhampton and Staffordshire General Hospital.—Res. M.O. £200.

The Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Strabane, Dingwall (Ross), and Poole (Dorset).

Births, Marriages, and Deaths.

BIRTHS.

DRESING.—On August 26th, the wife of Captain H. G. Dresing, *M.C.*, R.A.M.C., of a son.

HARTRIDGE.—On August 24th, at Millington Lodge, Millington-road, Cambridge, to Dr. and Mrs. Hartridge—a son.

NICKERSON.—On August 22nd, at a nursing home, Salisbury, the wife of Colonel W. H. S. Nickerson, V.C., C.B., C.M.G., R.A.M.C., of a daughter.

SMITH.—On August 18th, at Larkhall-rise, Clapham, S.W., the wife of Alex. A. Smith, L.D.S. Eng. of a son.

SPARROW.—On August 29th, at Wayside, Watford, the wife of E. C. Sparrow, M.A., M.B., B.C., of a daughter.

WARREN.—On August 10th, the wife of Surgeon Commander L. Warren, O.B.E., R.N., of a daughter.

MARRIAGES.

DAY—HUGHES.—On August 26th, at St. Clement's Church, Sandwich, Kent, by the Rev. O. Bruce Payne, Vicar, assisted by the Rev. B. W. Day, father of the bridegroom, Harold B. Day, *M.C.*, M.D., F.R.C.P., of Cairo, Egypt, to Winifred Blanche West, second daughter of Mr. and Mrs. W. J. Hughes, of Strand House, Sandwich.

GORDON-TAYLOR—PEGRUME.—On July 24th, at All Souls, Langham-place, Gordon Gordon-Taylor, O.B.E., M.A. Aberd., M.S., M.B., B.Sc. Lond., F.R.C.S., to Florence Mary, eldest daughter of John Pegrume, of Waltham Abbey, Essex.

HORT—THOMPSON.—On August 17th, at Distington Parish Church, Cumberland, Frederick Aylmer Hort, M.A., M.D., B.Sc., L.R.C.P., M.R.C.S., to Muriel Mary, eldest daughter of the Rev. George and Mrs. Thompson.

MAHONY—BURNS.—On August 25th, at the Church of the Holy Name, Manchester, by the Rev. B. Butler, S.J., Martin James Mahony, L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., to Elizabeth, daughter of Mr. and Mrs. Thomas Burns, Rochdale.

MEARNS—GOODRICH.—On August 18th, at All Saints Church, Child's Hill, Captain Alexander Mearns, R.A.M.C., to Gladys Audrey, elder daughter of Mr. and Mrs. Cavendish Goodrich, Ilfracombe.

DEATHS.

HUNT.—On August 26th, at Chagford, Albert W. Dunning Hunt, M.R.C.S., L.R.C.P. Lond., in his 45th year.

SHACKLETON.—On August 26th, at Longton-grove, Sydenham, Henry Shackleton, M.D., Trin. Coll. Dublin, in his 74th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

SEXUAL MATURITY AND SENILITY: RECENT EXPERIMENTAL STUDY.

SENILITY, according to Dr. E. Steinach—sometime professor of physiology in the German University at Prague and now in Vienna—is occasioned through lack of the hormone secreted by Leydig's cells. His book, "Verjüngung," recently published by Julius Springer in Berlin, describes the various steps which have led to successful rejuvenation. Marshall and Jolly originated this research in 1908, when they showed that a transplanted ovary is capable of maintaining the sexual characters of the individual. About the same date, Steinach observed that autoplastic transplantation of the testes in a juvenile rat produced normal development of the vesiculæ seminales, prostate, and penis, but that the hormone concerned arose, not from the generative cells, but from the interstitial cells described by Leydig. These experiments disposed of the theory that the effect of the testes is to be explained by Ehrlich's side-chain theory. In the female rat, as well as in the male, sexual characters are found to be dependent on the interstitial cell hormone. Experimenting with castrated infantile rats, Steinach observed that the transplantation of normal testes brought about reproduction of the interstitial cells, but degeneration of the spermatocytes. The animal thus treated also displayed an accentuated libido and potency, together with a hyperdevelopment of the secondary sexual characters. The intimate relation between the interstitial cells and sexual development was further emphasised by the fact that such development could be controlled by the operative addition or removal of grafted tissue. The conclusions drawn from the histological sections will require confirmation for, as B. Romeis has pointed out in the current number (August 27th) of the *Münch. med. Wochenschr.*, the staining method employed by Steiner was not adapted clearly to distinguish between interstitial fibrosis and interstitial glandular hyperplasia.

Rejuvenation of Senile Rats.

Owing to the close resemblance between the undeveloped condition of the secondary sexual characters in the animal whose hormone-producing tissue had been artificially reduced, and the condition in the senile animal, Steinach was led to believe that the latter also could be brought under control. He therefore endeavoured to restore vigour and potency to senile rats in the same way as he had restored them to castrated juvenile individuals. He selected rats for the purpose of these experiments as they rapidly develop senile symptoms—the average lifetime being two years—and also the difference in appearance and behaviour between young and old individuals is so marked that any alteration is easily discernible. Steinach claims almost invariable success as a result of his operative methods, which consisted of ligature of the vas deferens or coni vasculosi between the testes and epididymis. Rats that had previously shown every symptom of senility, such as total loss of potency and sexual interest, inactivity, lousy condition, baldness, &c., within two weeks were completely rejuvenated. They became active and clean; the hair reappeared; the media of the eye regained their youthful transparency. Sexual interest and potency were restored, frequently to a hypernormal degree. A brief summary of his notes on one of the experiments will bring out these points more forcibly:—

Male rat, aged 27 months; no sexual potency and every sign of senility; operated on 2/3/14. Ligature of coni vasculosi between testes and epididymis on both sides. Hypernormal sexual activity and potency 20/3/14. Gain in weight and appetite; very active, inquisitive, and courageous 30/3/14.

In the case of females, by transplanting the ovaries of a four months' old individual into a senile individual of the same sex, he produced a complete change in the appearance of the subject. The degenerated mammary glands reappeared, and the animals gave birth to healthy offspring.

Application to Man.

Steinach was so encouraged by the success of his experiments on rats that he determined to apply the same methods to men. For advanced cases of male senility he recommends a simple ligature of the vas deferens, while in the case of those suffering from premature senility he has obtained results that were very satisfactory by ligature of the coni vasculosi. These operations have been performed by Dr. Lichtenstern, under the direction of Steinach. Several cases are described in Steinach's book, but it will be sufficient to quote one here.

A man, 71 years old, suffering from breathlessness, trembling, weakness of the heart, feeble mentality, and impotence was obliged to have his left testicle removed on account of an abscess. At the same time the ligature of the vas deferens to the right testicle was carried out. Within a few months after the operation the man was muscularly and organically strong. He grew fresh hair and beard, and his face assumed a youthful appearance. Sexual interest and potency were restored to a marked degree.

In passing it may be remarked that no such rejuvenation has been recorded in this country in the many cases in which the vasa have been tied in old men for prostatic hypertrophy. The operator in fact rather had in view the abolition of sexual vigour. Although in the case of female rats Steinach produced rejuvenescence through the transplantation of the ovaries of a young individual, this method has not as yet been applied to women owing to lack of opportunity. Steinach believes that it would prove successful if tried. Further research into the rejuvenescence of women will, he thinks, develop the use of X rays, which have been successfully employed to stimulate the reproduction of the interstitial cells in animals.

Experimental Masculinisation and Feminisation.

There is ample experimental and other evidence to show that in the vertebrata the internal secretions of the generative glands are factors and perhaps the chief factors in determining the development of the visible secondary sexual characters, and that the factors act independently of the normal generative functions of the glands. The source of the internal secretion or secretions of the ovary is not so definitely proved to lie in the interstitial cells as is that of the testis. The effects of removal of both organs are well known, and so are some of the effects of grafting of these organs. Steinach, however, between 1911–13 added considerably to our knowledge by his experiments on the transformation of the sexual characters in mammals by exchanging the sexual glands. Homological transplantations are conducted between individuals of the same sex and heterological between individuals of different sex—so-called "experiments on transformation." Steinach showed—and this has been confirmed by other observers—that preliminary castration of the experimental animal is absolutely essential for the ingrafting of the heterological gonads, for if there be no previous castration the graft perishes. Whether this is due to an antagonism between the sexual hormones as maintained by Steinach or to an immunity of the non-castrated organism from the hormones of the heterological sexual organs as more recently suggested by K. Sand need not here be discussed, but the striking physical and psychical effects resulting from the grafts are remarkable. Steinach castrated young guinea-pigs and rats, and grafted at the same time ovaries from the same species, either under the peritoneum "in pockets" or subcutaneously. The grafts took root, healed, grew, and became fully functional in the body of the male; the primordial follicles developed to large follicles with normal ova and some reached maturity, burst, and formed corpora lutea with typical lutein cells. The interstitial cells of the ovary also showed a tendency to increase. The implant had all the essential characters of a functional ovary, though it did not attain the same size as in the normal animal. The graft had no accelerating influence on the growth of the true male characteristics—the penis, prostate, and vesiculæ seminales remained infantile just as they do in early castrated males. If, however, the uterus and Fallopian tube were ingrafted with the ovary they were stimulated to growth and development. Specially noteworthy were the effects on the mammary gland—nipple, areola, and glandular tissue—their growth was greatly accelerated and this became as large as the corresponding parts in a normal female of eight to ten months. The influence of the transplanted ovary also affected the growth, proportions, and form of the body and skeleton, and the animal assumed the general characters of a female. Even the hair and fatty deposits corresponded to the female type.

The most prominent change, however, was that of the psychical sexual characters. The animals did not behave with indifference towards normal males as do castrated males, but showed marked sexual instincts and were treated as females. The necessary hormones, probably derived from the thecal tissue and corpus luteum, produced typical female somatic and psychical changes in the male—i.e., what has been called "feminisation." Similarly by grafting testes on castrated young guinea-pigs or rats—i.e., heterological transplantations—"masculinisation" may be produced. The clitoris in the rat becomes greatly hypertrophied. Lipschütz described in one of Steinach's masculinised guinea-pigs hypertrophy of the clitoris, two corpora cavernosa, and also the quill-shaped growths of the male, so that this penis-like organ represented a totally hypospadiacal penis.

Production of Animal Hermaphrodites.

In 1916 Steinach by ingrafting at the same time both kinds of sexual glands on the same infantile castrated male succeeded in producing a hermaphrodite animal. The experimental animal showed a development of homological and heterological characters, both somatic and psychical,

and, what is more remarkable, the psychic characters became periodically either male or female. K. Sand has more recently confirmed these observations and improved the technique. A testis and an ovary may be simultaneously transplanted into an infantile mammal. The ovary may even be placed in the middle of the grafted testis, forming an ovario-testis when the ovary grows and forms corpora lutea and the testis flourishes. It is thus possible to produce an artificial hermaphrodite both somatically and psychically. These remarkable results may be commended to the consideration of those who have read the attractive lecture by Sir F. W. Mott on "Body and Mind," published in THE LANCET of August 21st, 1920, in which he discusses the Freudian school of psychologists who "assert that all psychic energy has its roots in sexual instinct, and maintain that the sexual life of the individual begins its development at birth or even before birth."

SANITARY CONDITION OF THEATRES AND MUSIC-HALLS.

THE unsatisfactory sanitary conditions in those parts of theatres and music-halls to which the public are not admitted have long been the subject of legitimate complaint by artistes and staff. Not only is there want of proper lavatory accommodation, insufficient ventilation, and dirt in dressing-rooms, but the complaints received by the Ministry of Health have included instances of defective structural conditions and inadequate precautions against fire. The sanitary conditions in many theatres and music-halls are represented as so unsatisfactory as to endanger the health of persons employed in the performances. The Ministry has issued a circular to local authorities, suggesting that all theatres, music-halls, and other places of public entertainment should be visited periodically by inspectors of nuisances, who should report both to their authority and to the licensing authority any cases in which the conditions are found to be unsatisfactory. The coöperation of the Secretary of State has been enlisted and licensing authorities are being asked to require a certificate from the inspector of nuisances that the condition of the building is satisfactory in sanitary and other respects before the granting or renewal of a licence. This combined action should lead to a prompt amelioration of conditions which have long been a reproach to the business side of drama.

BROUGHT TO THE BOIL.

THE following incident, which happened at the Great Northern Central Hospital, is given in the first number of *Progress* (price 3*d*.) as an instance of the need for hygienic education in the neighbourhood served by the hospital:—

> A young mother recently brought her baby to the hospital, and the medical officer on examination found that the child was suffering from convulsions. He prescribed the necessary treatment, and the mother inquired as to what procedure she should adopt in the event of the child suffering from a similar attack. The doctor advised her to put the baby into a bath of warm water. A few weeks later the mother again brought her child to the hospital, and the doctor, on a further examination, discovered signs of the infant having been burned. He inquired of the parent the cause of the injury, when she stated that upon the child receiving a further attack, and she not having any warm water available at the moment, placed the baby in a bath of cold water, which she placed upon the fire in order to bring the water to the necessary temperature.

The hospital is enrolling a corps of collectors and using this little journal as a method of propaganda.

THE CORROSIVE CONTENTS OF A GOLF-BALL.

AN inquest was held at Blackburn on August 19th on a young girl who had picked up a golf-ball, and who died after swallowing some liquid which she had obtained when stripping off its coverings with her teeth. The analysis showed that the core of the golf-ball was a liquid contained in a small rubber pouch with a tubular opening tied with a piece of rubber tape. Most of the liquid had leaked out, but what remained was strongly alkaline in reaction and its basic principle was silicate of soda. A jelly-like mixture of the same appeared to form the core of the ball, and in biting the covering the girl probably swallowed some of the corrosive contents, which caused acute alimentary inflammation, ulceration, and subsequent death.

In THE LANCET of July 18th, 1914, we recorded the case of serious injury done to the eye of a golfer through the inner core bursting on his making an inquisitive examination of the construction of the ball. A companion ball at the time was examined in THE LANCET Laboratory, and the inner rubber pouch was found to contain a fluid of high density, which proved on analysis to be a strongly alkaline fluid, consisting mainly of potash soap. We concluded our note by the following sentence: "For the sake of children who may get possession of old golf balls we think that it should be widely known that to experiment with the structure of certain varieties is attended with grave risks." The incident recorded is a regrettable case in point.

DISCONCERTING ACCURACY.

A MEDICAL man examining a new deaf patient asked as a preliminary question, "Is it your right or your left ear that is troubling you?" and received as a reply, "It is my middle ear."

THE LITERARY YEAR BOOK.

To the Editor of THE LANCET.

SIR,—It is intended to make this work an absolutely reliable reference book. Would you kindly permit me, therefore, through your columns, to request authors who have not hitherto sent to the editor of this book details of their works to do so as soon as possible? In all cases a proof will be sent for personal correction, and it is requested that communications should reach me before Sept. 30th.

I am, Sir, yours faithfully,

MARK MEREDITH,
Editor.

67, Dale-street, Liverpool, August 17th, 1920.

Communications, Letters, &c., to the Editor have been received from—

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F.—Dr. Z. P. Fernandez, Leeds; Prof. J. E. S. Frazer, Sea View.

G.—Dr. E. Goodall, Cardiff; Mr. F. C. Goodall, Lond.; Dr. A. D. Gardner, Wadebridge; General Board of Control, Edinburgh.

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I.—Illuminating Engineering Society, Lond., Hon. Sec. of.

J.—Dr. F. H. Jacob, Nottingham; Dr. H. W. Jones, Liverpool; *Journal of the American Medical Association*, Chicago.

K.—King's College Hospital, Lond.

L.—London (Royal Free Hospital) School of Medicine for Women; Dr. G. C. Low, Lond.; Dr. J. D. Leigh, Sunderland.

M.—Dr. S. McNaughton, Sunderland; Dr. J. B. McDougall, Wakefield; Ministry of Health, Lond.; Mr. S. E. Medland, Burnham-on-Sea; Dr. T. W. Mitchell, Hadlow; Miss N. March, Lond.; Medical Sickness, Annuity and Life Assurance Society, Lond.; Dr. R. S. McClelland, Dowlais; Mr. R. F. Moore, Lond.; Metropolitan Asylums Board, Lond.; Major A. Macdonald, R.A.M.C.; Mr. J. J. R. Macleod, Paisley; Dr. J. Moore, Lond.; Dr. E. N. M. Milligan, Glossop; Middlesex Hospital, Lond.

N.—National Alliance of Employers and Employed, Lond., Sec. of; National Safety Council, Chicago; Sir G. Newman, Lond.; *Nursing Times*, Lond., Editor of; National Council of Trained Nurses of Great Britain and Ireland.

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Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

The Lumleian Lectures

ON THE

CLINICAL EXPERIENCES OF A PHYSICIAN DURING THE CAMPAIGN IN FRANCE AND FLANDERS, 1914-19.

Delivered before the Royal College of Physicians of London

BY SIR JOHN ROSE BRADFORD, K.C.M.G., C.B., M.D., F.R.S., F.R.C.P.

LECTURE I.

MR. PRESIDENT, FELLOWS OF THE COLLEGE, AND GENTLEMEN,—My first duty is to express to you, Mr. President, and to the College my sincere thanks for the honour conferred on me by the request to deliver these lectures to the College. In seeking for a subject suitable to the occasion it seemed that a short description of some of the clinical manifestations of disease such as I had the opportunity of observing whilst acting as a consulting physician to the British Expeditionary Force might be of interest. Such an account, however, as given now, must be very incomplete, and will, in fact, consist of little more than a record of some impressions, a survey of a more or less cursory character of the observation of very large numbers of cases of diseases of very different and varied nature. Further, it will deal more especially with disease from the standpoint of general medicine rather than with the special diseases directly related to the operations of war itself, such as trench fever and the effects of gas warfare.

VARIED OPPORTUNITIES FOR CLINICAL STUDY.

I propose, however, to discuss in one lecture some of the clinical phenomena seen as a result of gunshot wounds of the chest, the study of which revealed many interesting features. The field available for clinical study was enormous; the mere numbers concentrated in the larger hospital areas, where it was not unusual for some 20,000 or more beds to be occupied, alone afforded opportunities never, perhaps, available before. This mass of clinical material, thanks to the organisation of the Medical Services, the large number of skilled medical officers, and the equipment of the military hospitals, could be studied in a satisfactory manner, although naturally the exigencies of military service prevented in some instances the complete study of cases interesting only from the standpoint of medicine.

The field available for observation was not only large but also varied. In the earliest periods of the war the army consisted of a specially selected portion of the male population, inured to military service. Later, but still early in the war, the armies were formed of the finest specimens of the youth of this country, who, after undergoing a prolonged training, came out to France in magnificent health and in full vigour of body and mind. Later the periods of training were necessarily shortened, the age of the men increased, the standards somewhat relaxed, and towards the end of the war a certain proportion of the men were considerably younger and the standard of physique lower. These differences, however, were not those that made the opportunity of the physician so unique; this arose rather from the variety of race represented in the forces. From an early period of the war we had large numbers of soldiers from the Dominions—Canadians, Australians, New Zealanders—and a very short clinical experience often showed that these men reacted to disease in a manner different from that seen with our own home troops. Further, the Indian troops and those from the West Indies also afforded much food for thought, not so much from the point of view of the introduction of diseases more or less peculiar to or prevalent in these races, but rather from the point of view of the extraordinary differences in their reaction to the diseases prevalent in France and Flanders and affecting Europeans and those of European descent.

Thus the material available for clinical study provided by the actual fighting men was extraordinarily large and varied, but the field was really much greater than this, because in the latter stages of the conflict large numbers of men were enlisted for labour companies, and an army of women was also enrolled, in addition to the large number of women who had been engaged in nursing from the earliest stages of the war. When all these organisations were in full working order, as they were during the latter half of the war, the population that fed the hospitals was comparable to that of civil life, but with the very important qualification that it was still a selected population, both as regards age and as regards physique. The physician had the opportunity of studying the incidence of disease in a population where all diseases were, so to say, "notified," and not, as in civil life, where only certain diseases are so notified. This fact alone should provide ultimately much material of value for the study of disease, but naturally this subject is much too large to be dealt with here, and can only be adequately considered in the medical history of the war. Further, the experience of one individual, large as it was, is necessarily far too limited to deal with such an enormous and varied mass of material.

Although disease in war has usually claimed more victims than direct enemy action, and although military operations have often been hampered by the outbreak of disease, and especially of epidemic disease, yet the Great War was the only one in recent times where the military authorities made any special provision for physicians to accompany the armies in the field. Although from time to time in the past certain army medical officers in the field devoted themselves more especially to the problems connected with the sick, nevertheless the rôle of the doctor in the field was held to be that of an officer dealing especially with battle casualties. This is very natural when one considers the urgent nature of the medical, the military, and the humanitarian problem that presents itself during an engagement, whether it be part of an advance and attack, or the still more difficult question of dealing with the wounded when the military operations demand a retirement. The problem the military surgeon has to solve to the best of his ability is an urgent one, brooking no delay; the need is obvious and patent to all, even to those most ignorant of medicine. Failure to deal successfully with the wounded, either from the professional or the administrative side, is so obvious to all that it is not surprising that this side of the army medical officer's work has loomed large in the eye of the army, the medical profession, and the public, and it is right that it should do so, as it is work of the greatest importance from all points of view—military, professional, and humanitarian.

The rôle of the physician is different, but none the less also of value, both from the professional and military points of view. It is often said that his main function is the prevention of disease, although some would place prevention under the sole control of the sanitarian (who may or may not be a physician), and would seem to be under the impression that surgery and sanitation between them included all the problems likely to be met with by an army during military operations. Great as are the services rendered by the sanitarian, especially with an army in the field, the physician is still required, inasmuch as the prevention of the spread of disease requires not only the recognition or diagnosis of fully declared and typical instances of disease, but also the recognition of anomalous forms of common diseases. This is often a matter of some difficulty and one requiring considerable clinical experience and acumen and one of peculiar importance in military medicine, where the prevention of epidemic disease may well depend on the recognition of initial cases perhaps anomalous in their clinical manifestations. With this aid all the resources of the sanitarian can be brought to bear on the problem at once and early. The surgeon, the sanitarian, the bacteriologist, and the physician are all required in order to

deal adequately with medical problems on active service, and, further, they must work together and in harmony; no one of them can take on and perform satisfactorily the duties of the other; still less can any one of them deal with the whole problem. This was recognised only to some extent in the Army Medical Service prior to the war, encouragement was given to medical officers to specialise as surgeons, sanitarians, or bacteriologists, but it took several years of war for the real value of clinical medicine, as a subject of considerable importance for the maintenance of the efficiency of the fighting machine, to be recognised. Then steps were taken to place officers with special qualifications for the work in positions where their work could be effective.

The Surgical and the Medical Side.

The work of the army surgeon and of the army physician is in many respects very similar, and has the same general objects in view. Thus there is the humanitarian side, which concerns itself with attempting to provide the best possible treatment to the wounded and to the sick. Then there is the military side, which is more especially the problem of "wastage" and the best methods to adopt to check wastage and to bring the sick or wounded man back to duty as soon as possible. This question is of the first importance, both on the surgical and on the medical side, but it is a much bigger and more difficult question on the medical side, and it is here that the physician is of most value to the efficiency of the military machine. Surgery in the late war has done much to check undue wastage owing to the improvements effected in the treatment of wounds and the shortened stay of the wounded in hospital. This work was especially valuable inasmuch as wounded men, apart from their wounds, were in robust health, and thus provided the wound was soundly treated, could return to duty in a comparatively short time, especially in the case of the more slightly wounded. On the medical side the control of wastage was more difficult for several reasons. In the first place, the numbers dealt with were far larger, although this war, at any rate so far as concerns the campaign in France and Flanders, has been remarkable for the relatively small amount of disease, still the actual numbers of sick have been far larger than the number of wounded. Further, it must be remembered that the casualties from gas warfare were treated by physicians, although for statistical and other reasons they were included amongst the battle casualties and regarded as wounded.

Wastage.

These cases afforded many problems in connexion with the question of wastage, problems by no means simple in nature and requiring for their solution all the skill and experience of trained medical observers. Thus it may be said that not only was the number of cases very large on the medical side, but also that the question whether a man was fit to return to duty was very often a difficult one requiring much clinical experience for its solution. Wastage, however, arises quite apart from battle casualties, whether from wounds or the effects of gas warfare, or from nervous disorders, and in fact in all wars, including the late war, the main wastage is dependent upon disease and often on disease that might at first sight be thought of little interest or importance. Here the work of the physician is of especial value, as an extraordinary amount of wastage may ensue as a result of erroneous or incomplete diagnosis; disease of the skin and functional disorders of the heart afford illustrations of such conditions. Wastage on a very large scale may ensue as the result of the spread of epidemic disease. In some instances as, for example, in the outbreaks of true influenza in 1918, our present available methods of dealing with such problems only yield a very moderate measure of success. In other cases, such as the formidable diseases, cerebro-spinal fever and dysentery, much greater success is achieved, but in all cases success is largely dependent upon the recognition of early cases. The records of medicine, civil and military, old and recent, contain numberless instances of epidemics of disease where the initial cases were diagnosed erroneously. On the other hand, they also record instances where an acute clinical observer has recognised a malady in an unusual form, and prompt measures have led to the suppression of the threatened outbreak. In an army such questions are of the very first importance; much harm may result from initial cases of dysentery being regarded as diarrhœa, or of cerebro-spinal fever being thought to be that protean disorder, influenza. These are questions of clinical medicine, although for their complete solution the services of the bacteriologist are required. Much harm, however, may be done by placing undue emphasis on one or other of these two branches of knowledge, especially in an army in the field. Thus some would take the view that no diagnosis of dysentery is justified unless there is bacteriological proof of the presence in the excreta of the causative organism. This is, of course, the correct attitude to take in a contribution to the study of the disease, but it is not the correct view to take when dealing with a supposed outbreak of the disease in an army in the field. There the opinion of the clinician, formed summarily at the bedside and based on symptoms, should be sufficient for the case to be regarded and treated as dysentery, at any rate temporarily, pending further and more complete study. Doubtless, errors will be made, and some cases not dysenteric in nature will be regarded as such, but much less harm will be done than by refusing to regard a case as dysenteric until the organism has been isolated. Much dysentery, especially in armies, will always be regarded as mere diarrhœa, but all cases with blood and slime in the motions should unhesitatingly be labelled dysentery on clinical grounds alone. Epidemics of dysentery in armies are prone to develop considerably before being adequately and firmly treated, owing to the tendency to regard the early cases as mere diarrhœa, for a variety of reasons. Much may be done to minimise this danger if care is taken to segregate, whenever possible, cases of diarrhœa.

The control of wastage from dysentery is mainly a question of diagnosis and sanitation, but here, as in the cases of enteric fever and cerebro-spinal fever, there is also the vexed and very difficult question of "carriers"; and the frequency of relapse as a result of a return to normal food still further complicates the problem of wastage in the case of dysentery. All these questions demand for their solution much clinical experience, but a great deal can be done to check this wastage by accurate clinical diagnosis.

I propose, Sir, after these general introductory remarks, to pass on to the consideration of certain experiences that are not without interest. In one lecture, the third, I propose to deal with some of the clinical phenomena seen as a result of gunshot wounds of the chest; in my second lecture I hope to discuss certain diseases, such as nephritis and polyneuritis, from the clinical side; and, to-day, to deal more generally with certain impressions formed as a result of the survey of the clinical field as a whole and from the standpoint of general medicine rather than from that of the special pathological states induced as a direct result of active service.

ORGANIC HEART DISEASE.

In the first place, it may be said that, speaking broadly, the medical examinations made in this country prior to the men being sent overseas were successful in detecting gross organic disease, even in its many latent forms. This is shown by the fact that it was exceptional to meet with patients suffering from obvious organic diseases, such as diseases of the heart, although, as might be expected, a few cases of aortic regurgitation that had escaped detection were seen from time to time, and amongst the large numbers of cases of paroxysmal tachycardia that came under observation a few cases of mitral stenosis and some with auricular fibrillation were met with. One such case of auricular fibrillation was of considerable clinical interest, in that it illustrated a rare type with a group of symptoms only occasionally

seen, and these very liable to lead to difficulties in diagnosis owing to the simulation of an acute abdominal condition. The attacks of paroxysmal tachycardia seen in cases of auricular fibrillation may not only sometimes be very sudden in their onset, but may also be ushered in with severe abdominal pain instead of mere præcordial discomfort. This abdominal pain may be epigastric in position and accompanied with some local tenderness, together with some nausea and vomiting. The patient may be apparently very ill, with considerable collapse and much anxiety. In such a case an error of diagnosis may easily be made, if attention is concentrated on the abdominal pain and vomiting. The characteristic irregularity of the pulse may not be correctly interpreted, and the case may be regarded as an abdominal one and a perforation of the stomach or intestine diagnosed, the pulse being attributed to the effects of collapse, whereas in reality it is characteristic of the cardiac lesion present. I have seen two such cases—one, the case alluded to above, and one in civil practice prior to the war. In both laparotomy was performed under the mistaken diagnosis of perforation owing to the marked character of the abdominal symptoms and the apparent alarming condition of the patient; although in reality auricular fibrillation in association with mitral stenosis was the sole lesion present. In both cases the patient recovered. Mitral stenosis is not the only chest condition in which this error may be made; somewhat similar epigastric pain, together with collapse and some vomiting, closely simulating an acute abdominal lesion, may be seen, as is well known, in certain cases of angina pectoris, and also, strange as it may seem, in cases of sudden and extensive pulmonary embolism. In the latter instance the presence of urgent dyspnœa and of some degree of cyanosis should, however, be sufficient to prevent such an error of diagnosis.

RARITY OF CASES OF ACUTE RHEUMATISM.

Valvular disease of the heart was then an uncommon lesion, and this leads naturally to the consideration of one of the most interesting features of the medicine of the war—i.e., the rarity of the occurrence of acute rheumatism. Very few cases of this malady were seen, although such as did occur were of the classical type, and not uncommonly accompanied with pericarditis with effusion. When we consider that we were dealing with a population of an age suitable for this malady, and what the conditions were as regards exposure to cold, damp, and wet, to say nothing of fatigue, it is certainly noteworthy that the disease was as exceptional in its incidence as it proved to be. This fact would tend to support the views of those who hold that this disease is not specially associated with exposure to wet and damp. Further, it would seem that this experience in the recent war is similar to that recorded for the British Army in the Crimean campaign, where, notwithstanding the rigours of the climate, pericarditis of rheumatic origin was uncommon. The experience as to the incidence of acute rheumatism in this war is more especially interesting owing to the fact that this malady was equally uncommon amongst the large numbers of women employed by the army, although they also were of an age favourable to its occurrence. The very different incidence of acute rheumatism in the military hospitals in France from that familiar to us in civil hospitals in London was therefore very striking.

One case of acute rheumatism in a young nurse merits notice owing to the anomalous mode of onset and unusual clinical course of the malady. A nurse whilst on duty and not obviously ill was seized with symptoms of præcordial discomfort and slight faintness, and was found on examination to have slight pyrexia, the temperature being a little over 99° F. and a very slow pulse, both the pulse-rate and that of the heart being only 30 per minute. She was confined to bed, and the brachycardia and slight pyrexia persisted without the development of any other signs or symptoms beyond a faint systolic apical murmur that was not always audible. The pulse-rate gradually returned to the normal rate, and at the end of a week the temperature rose to between 101° and 102° F. and effusion occurred into many joints, the ankles, wrists, knees, and elbows, together with much pain, and the illness then followed the normal course of an attack of acute rheumatism, and the systolic apical murmur that had been heard occasionally and with difficulty in the earlier stages became now quite marked and obvious. The pulse increased considerably in rate, and the cardiac features of the case became much more pronounced in that there were considerable palpitation and tachycardia and the heart became enlarged, although there was never any evidence of pericarditis. On two separate occasions attacks of very severe tachycardia occurred, accompanied with extreme irregularity of the rhythm, and the pulse could not be counted owing to its frequency. These attacks were very severe and lasted several hours, and on one occasion the patient was in a critical condition for several hours. Recovery took place very slowly, and the patient was confined to bed for several months. Ultimately she recovered sufficiently to return to this country and some two years after the illness she was in good health, vigorous and able to return to work, presenting no abnormal physical signs except a faint apical systolic murmur with no signs of appreciable cardiac enlargement.

This patient would seem to have been an instance of one of those rare cases where the rheumatic virus affected primarily the myocardium, causing first brachycardia and subsequently extreme tachycardia probably due to auricular fibrillation, but certainly due to pathological changes in the auricular muscle. During the whole of my service in France no case of death from acute rheumatism came under my notice, nor did I see any case of rheumatic hyperpyrexia.

INFECTIVE ENDOCARDITIS.

A certain number of cases of infective or malignant endocarditis were, however, seen, although there were no reasons on clinical grounds for associating them with acute rheumatism; these cases presented both clinically and on post-mortem examination some features of interest. In view of the enormous number of septic wounds, especially during the first years of the war, it might have been expected on a priori grounds that infective endocarditis would have been of very frequent occurrence. The physician was not uncommonly asked to see cases where this complication of an infected wound was suspected to be present, owing to the presence of persistent and irregular pyrexia and the absence of any obvious cause for this in the state of the wound itself. It was, however, rare for signs to be present sufficient to justify such a diagnosis inasmuch as these cases usually presented only an irregular temperature and possibly a systolic murmur, signs, it is true, of a septic infection, but not characteristic of or limited to infective endocarditis. Post-mortem examination of large numbers of such cases showed the rarity of acute infective endocarditis as an early complication of infected wounds. Careful observation by a number of surgeons showed, on the other hand, that many of these cases were really of a different nature and dependent upon the wound infection causing thrombosis of, or even the presence of purulent clots in, the great veins of a limb, stump, or other part.

Whilst acute infective endocarditis was only rarely seen as a complication of septic gunshot wounds, quite a number of cases were seen where it arose primarily and in unwounded men. It is rather remarkable that in most of these cases the infection was a primary one, attacking healthy valves, and not superimposed on old valvular lesions. Some cases of the latter and more common variety in civil practice were, of course, seen, both clinically and in the post-mortem room; but the point I wish to draw attention to is that an appreciable number of cases of primary acute infective endocarditis of the well-known type occurred in unwounded men with cardiac valves showing no signs of previous disease and where the source of the infection was not discovered. No septic focus was found in such cases, and they were not the sequel of pneumonia. Further, so far as my experience went, such cases were more frequent than cases following as a result of a septic wound, and they not uncommonly ran an acute and rapid course clinically.

CEREBRO-SPINAL FEVER.

Cerebro-spinal fever is a malady of great clinical interest and of considerable military importance, and it is a disease that presents several problems still awaiting solution. The earliest cases in the British

Expeditionary Force were seen in the late autumn of 1914, and it may be of some interest that in the very first batch of cases seen there were some that presented anomalous features, not only in their initial symptoms and mode of onset, but also in their clinical course and in the nature of the cerebro-spinal fluid.

Anomalous Cases.

Anomalous cases presenting similar features were seen from time to time throughout the campaign in association with other cases presenting the more classical and well-known symptoms of the disease, and it is to a certain group of such cases that I desire to direct your attention. This group of cases presented a distinct and fairly uniform picture of a malady with a sudden onset, with fever, headache, and vomiting, together with pains in the limbs of varying severity.

The patient rapidly passed into a condition of apparently considerable gravity with partial unconsciousness, or in the less severe cases into a stuporose condition with imperfect realisation of his surroundings. In all cases there was quite definite and marked retraction of the head, and the pulse-rate was usually slow. These cases always resembled closely cases of undoubted cerebro-spinal fever of a moderately severe type, and the more severe forms with a very sudden onset were practically indistinguishable clinically from cases of cerebro-spinal fever. One point that always made a positive diagnosis of cerebro-spinal fever a little doubtful in such cases was that Kernig's sign was not usually of the absolutely definite character—that is, associated with cerebro-spinal fever. In other words, the fixity or the rigidity of the knee was of a more plastic character and not of the locking character associated with cerebro-spinal fever. Nevertheless, the physical signs, including Kernig's sign, the initial symptoms, and the severe illness were all often so closely similar to those of true cerebro-spinal fever, that an accurate diagnosis was impossible in many cases without lumbar puncture. Lumbar puncture in these cases always yielded the same result. There was a considerable increase in the amount of cerebro-spinal fluid obtainable on puncture, and the fluid was under great pressure, but the fluid not only showed no abnormal cell elements, and no organisms were obtained on culture, but it was always extraordinarily clear and limpid in character. The quantity obtained was always large and sometimes very large, as much as 100 c.cm. being withdrawn at a single operation. The lumbar puncture was followed by rapid improvement and subsidence of the symptoms, and in most cases convalescence ensued rapidly and immediately. In some few instances the lumbar puncture had to be repeated, but this was quite exceptional, and in all the cases seen—some 20 in all—recovery was complete and usually rapid, no case being fatal. In a few cases, and notably in one that occurred in a medical officer, there was, in addition, a painful rash. This rash was present in the trunk, arms, and thighs, and consisted of small raised red papules tender on pressure; the tenderness on pressure was such as to cause considerable discomfort to the patient.

These cases formed a very definite clinical group, and their true nature is very obscure; it is difficult to determine whether they should be regarded as a variety of cerebro-spinal fever, or as mere so-called meningismus associated with a variety of diseases, or as an independent affection. The uniformity of the clinical phenomena and of the course of the affection, together with the absence of any evidence of the presence of other diseases in the patients, makes it very improbable that the cases were of the nature of meningismus complicating some other disease. The workers on cerebro-spinal fever in this country have described cases where no organisms were found in the cerebro-spinal fluid and where this fluid was clear; but whether these cases were of the same type as those just described is not quite certain, although it is probable. Our cases were characterised by an extraordinary limpidity of the fluid, together with a notable excess in quantity and sometimes, as mentioned above, a very great excess. Further, in the cases described in England the meningococcus, although not found in the cerebro-spinal fluid, was found in nasal swabs; but this was not the case in a series of these cases examined in France, as the meningococcus was not found in throat and nasal swabs in a single case of this type. The fact that these cases occurred at the same time as other typical cases of cerebro-spinal fever is, of course, a strong argument for linking them together. The clinical point I wish to emphasise is that these anomalous cases were often of a quite severe type with marked, and in some cases with urgent, symptoms, and that they were not by any means cases presenting only slight and equivocal signs or symptoms of cerebro-spinal fever; nevertheless, they were never fatal. Every clinician is familiar, especially during an epidemic of cerebro-spinal fever, with cases where the symptoms are suggestive of the presence of the disease, although they are not of a severe type, and where the results of puncture are negative and the patient rapidly recovers. The cases I have attempted to describe are not of this type, since they are often of a severe character, and during the first 24 or 48 hours of illness almost indistinguishable from cases of severe cerebro-spinal fever. I fear I am only able to give this short description of them and am not able to state positively their nature, although they seem to form a definite clinical group.

Difficulties in Diagnosis.

Cerebro-spinal fever sometimes presents peculiar and remarkable symptoms at its onset, and thus renders early diagnosis difficult. One of the most frequent of these anomalous types of onset is that in which dyspnœa is the leading symptom, and where other symptoms, such as headache and fever, although present, do not attract attention as they are comparatively slight; whereas the dyspnœa may be very marked and urgent. In some instances the dyspnœa is of sudden or, at any rate, of rapid origin and may be severe enough to cause the patient to sit up in bed. It is apt to be accompanied with some restlessness and probably some mental dullness and confusion. If due importance be not given to the presence of slight pyrexia such cases are very apt to be diagnosed as uræmic or even, as I have seen, as diabetic in origin, owing to the presence in the urine either of albumin or of some reducing substance. Several cases of cerebro-spinal fever of a very severe type and rapidly fatal have fallen under my observation where uræmia had been diagnosed on account of the severity of dyspnœa and the presence of mental dullness or stupor. In some cases the rash of the disease had been regarded as confirmation of the existence of uræmia. In all these cases the error was dependent upon the presence of albuminuria being regarded as proof of the existence of serious renal disease. In these cases with marked dyspnœa the dyspnœa is always very urgent and not infrequently it is a very early symptom. Such cases, so far as my experience goes, are very severe and usually rapidly fatal. There is no real difficulty in the diagnosis, as a complete examination of the patient reveals physical signs characteristic of the disease and lumbar puncture at once yields positive evidence. Cerebro-spinal fever may not only be confounded with uræmia, but it may also be confused with nephritis. The former mistake is merely an error in diagnosis and in the interpretation of certain signs and symptoms; but the confusion with nephritis is a more difficult problem, as it would seem that certain cases of cerebro-spinal fever may not only develop nephritis as a complication, but that in other cases for a certain period nephritis may be the only manifestation of the disease. Several instances of the association of nephritis with cerebro-spinal fever were seen, and in some the onset and cause of the illness was very remarkable. In the first place, nephritis may occur as a complication in ordinary cases of cerebro-spinal fever of moderate severity and running a normal course with the usual signs of declared and obvious meningitis. In such cases nephritis is also of the familiar type with or without anasarca. In 1915 I saw two such cases in adjoining beds with the late Dr. Carter, of Birmingham; in both the cerebro-spinal fever was of a severe type, and in the second week of illness the nephritis developed and was accompanied with very considerable anasarca. In such cases, however, both the meningitis and the nephritis are quite typical, and it is only that one occurs as a complication of the other. It is not this type of case that leads to error of diagnosis, but another type which is of greater clinical interest, and where the

initial manifestations of illness take the form of nephritis. The meningeal symptoms are at first absent, and only develop after the lapse of a week, ten days, or possibly even longer.

In these cases the onset of the disease is subacute, with headache, general pains, but not of great severity, possibly some initial vomiting and slight pyrexia. There is no sign of severe illness and no signs or symptoms suggestive of the presence of meningitis. The urine contains an appreciable, or it may be a considerable, quantity of albumin, together with epithelial and granular casts. Thus the diagnosis of nephritis is made and the patient's condition attributed solely to this. I have not seen anasarca in any such case, although it certainly may occur in the nephritis that develops as a complication in declared cases of cerebro-spinal fever. The patient with the supposed simple nephritis is not apparently very ill, but is apt to be very quiet and apathetic, and the headache and slight pyrexia persist. The headache becomes more intense, and then, after a variable period, sometimes a few days, in others longer, and in one case after three weeks, symptoms such as very intense headache, stiffness of the neck and possibly of the limbs become much more marked and reveal the true nature of the disease, and this is confirmed at once by lumbar puncture. Although the meningeal symptoms develop and increase, the nephritis does not, the renal lesion would seem to be always of very moderate intensity, and certainly not rapidly progressive. Several instances of this "nephritic" variety of cerebro-spinal fever came under my notice, and some were fatal, including one in a nurse.

Two other anomalous modes of onset in cerebro-spinal fever may be described shortly, although they are both rare.

In one the onset of the disease was very sudden with severe and repeated diarrhœa, accompanied with some abdominal pain and headache not of a severe character. The diarrhœa was profuse, and its sudden onset, with the fact that there were no other marked symptoms, led to the suspicion of some food poisoning being its cause. The diarrhœa lasted some 12 hours, and the next day the patient, a medical officer who had been in contact with cases of cerebro-spinal fever, expressed himself as having recovered from the attack; but he looked ill and had some headache and considerable albuminuria; the diarrhœa, however, had ceased, and only very slight pyrexia, the temperature being just over 99° F., was present. No signs of cerebro-spinal fever were observed although looked for, as the disease was rather prevalent at the time. During the next two or three days no symptoms developed beyond the fact that in the afternoon the headache became more marked and the temperature rose to 100°, and the patient began to complain of aching and stiffness in his limbs; these symptoms were absent in the morning. On the sixth day of illness the headache became more intense and lumbar puncture revealed the true nature of the disease, and the case was fatal at the end of another week.

A Remarkable Case.

The most remarkable case from the clinical standpoint of this disease seen by me was one where an officer had a febrile illness of some five weeks' duration with absolutely no signs of any kind beyond the presence of the pyrexia.

The fever was very high, reaching 105° F. on several occasions, and there was always a large daily oscillation so that the chart greatly resembled some septic infection. He had very few symptoms and for a considerable time did not apparently suffer from the pyrexia. I often saw him sitting up in bed reading, writing, &c. All the usual examinations, including repeated blood cultures, yielded negative results, and during all these weeks of fever no diagnosis was made. After some five weeks of pyrexia of this septic type he suddenly developed rigidity of the neck, accompanied with severe headache and vomiting, and lumbar puncture revealed the presence of meningitis, and the organism was recovered and successfully grown. After a very prolonged illness of a severe type and necessitating several lumbar punctures he ultimately recovered completely and served in the Air Force at the front. I have seen him recently, when he was in vigorous health and actively engaged in work.

In bringing to your notice these anomalous forms of cerebro-spinal fever I have purposely excluded the considerable number of cases where failure to recognise the malady depended only on the mere confusion of meningitis with such well-known diseases as rheumatism or influenza—in other words, mere errors of diagnosis made when confronted with the ordinary forms of meningitis, and when the apparent slightness of the symptoms failed to warn the observer that they were really dependent upon such a serious cause as cerebro-spinal fever.

Ætiological Significance of Anomalous Cases.

The study of these anomalous cases is of some interest in relation to the problem of the ætiology of the disease, and would seem to confirm the idea that the danger of direct infection from cases of the malady itself to others is not really very great. The anomalous cases I have described were necessarily not recognised in their early stages in many instances, and during this period they were often in general wards with no special precautions; yet the disease did not spread to others, even when, as in some cases, their stay in such wards was prolonged to several weeks. Thus, in some of the cases with an onset simulating nephritis a patient might be in a general ward for as long as two or three weeks, yet I am not aware of the disease having spread to others in any such case. This is in harmony with the rarity of the infection spreading from declared cases to others in close contact with the sick—e.g., medical officers and nurses. Although the direct spread of infection from the anomalous cases was not observed, nevertheless it is possible that such cases may lead to the development of the disease indirectly in the same way as the more usual types of the malady, and therefore their prompt recognition and isolation is equally important in all circumstances and more especially perhaps in military medicine.

TUBERCULOSIS.

The existence of large hospital camps afforded an opportunity for obtaining some statistics as to the incidence of tuberculous lesions both active and quiescent, owing to the performance of post-mortem examinations in the thorough and complete manner that is customary as a routine in civil hospitals, and it was possible for this to be done in these hospital camps, thanks to the centralisation of such work under the superintendence of a specially appointed medical officer with experience as a pathologist. The full and complete results of this work will doubtless be published later, and I only wish now to allude to certain facts of interest. I am indebted to the courtesy of Dr. T. H. G. Shore, who was the officer in charge of the morbid anatomy in the Etaples area, for some statistics that are of interest. Clinical observation in the hospitals showed that tuberculosis was not a very common ailment, but the large number of men dying from wounds after severe fighting, gave an opportunity probably never before obtainable, of getting reliable information as to the frequency of the presence of tuberculous lesions in the apparently healthy. The detailed study of the autopsy statistics of the war and especially those from large hospital centres where the morbid anatomy work was organised, will give valuable information on this and on other questions, but such studies are necessarily at present incomplete. The statistics I am now going to put before you are merely those of the incidence of tuberculous lesions as proved by post-mortem examination, in cases of death from all causes, including therefore deaths from wounds, accident, disease, and disease includes cases of death from tuberculosis. In other words, it records the incidence of tuberculous lesions as determined by post-mortem examination in the British Expeditionary Force. These observations were carried out during the later years of the war—i.e., in 1917 and 1918—that is to say, at a time when the personnel of the armies was perhaps not quite of the same standard as in 1914 with the old Regular army, or in 1915 with the original Territorial army and the original so-called Kitchener armies. Nevertheless, the army population of 1917 and 1918 was still a selected population, both as regards age and physique, and was not comparable to the mixed population from which a London hospital derives its patients.

Statistics of Tuberculous Lesions Post Mortem.

The total number of post-mortems performed was 2121, and in 256 cases a tuberculous lesion of some kind was present—that is to say, in 12 per cent. of the cases. In the 256 cases 62 cases are included where death was the direct result of the tuberculosis; in other words, there were 62

cases of fatal tuberculous disease amongst the 2121 post-mortem examinations made in deaths from all causes. Thus, although the total incidence of tuberculous lesions was some 12 per cent. of the total post-mortem examinations made, tuberculous lesions were present in men dying from wounds or from some acute disease other than tuberculosis in about 9 per cent. of the total number of cases examined post mortem. Dr. Shore has analysed these figures to some extent, and his results show that the actual incidence of tuberculosis is much the same in the British, Canadian, and Australian Forces. In these three separate forces the incidence varies only between 11·4 per cent. and 11·8 per cent. In the New Zealanders the incidence was much higher—i.e., 17·8 per cent.—but the number of cases examined was small—i.e., only 56 post-mortem examinations were made in New Zealanders, with 10 cases where tuberculous lesions were present, so that it would be unwise to draw any definite conclusion from so limited a number. In a series of 1513 post-mortem examinations yielding 146 cases with tuberculous lesions the situation of the lesion was as follows:—Pulmonary, 113; glandular, 74; miliary, 14; peritoneal, 14; renal, 20. Expressed in percentages: Pulmonary, 76·7 per cent.; glandular, 50·7 per cent.; miliary, 9·6 per cent.; peritoneal, 9·6 per cent.; renal, 13·7 per cent. If these are expressed as percentages of the total number of post-mortem examinations in the series the following are the results:—Pulmonary, 7·5 per cent.; glandular, 4·9 per cent.; miliary, 0·9 per cent.; peritoneal, 0·9 per cent.; and renal, 1·3 per cent. In the series of 1513 post-mortems there were, as mentioned above, 113 cases in which the tuberculous lesion was pulmonary. If these pulmonary cases are further analysed the following results are obtained:—In 27 cases (i.e., 23·9 per cent.) the lesion was active; in 21 cases (i.e., 18·6 per cent.) the lesion was chronic; and in 65 cases (i.e., 57·5 per cent.) the lesion was quiescent. In the 74 cases of glandular tuberculosis it is perhaps worth recording that 34 were thoracic, 32 abdominal, and in 8 cases both sets of glands were involved.

These statistics not only give results as to the incidence of tuberculous lesions in the army, but they may perhaps also be used, doubtless with many qualifications, to throw light on more abstruse questions, as, for instance, the different degrees of resistance of different races to the virus of tubercle. Dr. Shore has classified the results according to race; thus a small number of post-mortem examinations were made on natives of South Africa, of the West Indies, and of New Zealand Maoris. The numbers are small, but the incidence of tuberculosis was high; but although this is of interest, the most striking fact was that in all cases where tuberculous lesions were present the patient had died from tuberculosis, and no instance of either a chronic or a quiescent lesion was found on post-mortem examination of these native races. Further, in the white races the death-rate from tuberculosis presented considerable differences.

Thus although the percentage incidence of tuberculous lesions in the British Canadians and Australians was much the same, varying, as stated above, from 11·4 per cent. to 11·8 per cent., the death-rates in these different forces were very different. In the British, in a series of 1650 post-mortem examinations, there were 188 presenting tuberculous lesions, and in 31 these were the cause of death—i.e., the death-rate was 16·5 per cent. of those affected. In the Canadians the corresponding figures were: post-mortems 220, tuberculous lesions 26, deaths from tuberculosis 7, a percentage, therefore, of 26·9. In the Australians: post-mortems 93, tuberculous lesions 11, deaths 5—i.e., a percentage of 45·4. The figures for the New Zealanders are very small: post-mortems 56, tuberculous lesions 10, and deaths 8—i.e., a percentage of 80.

Thus the resistance of the men in the British Forces would seem to have been the greatest, and that of the natives of South Africa, West Indies, and Maoris the lowest, and that of the men coming from the Dominions intermediate between these two extremes. It would seem, however, that they also presented differences amongst themselves—e.g., the Canadians and the Australians.

DISEASES OF THE BLOOD.

A few cases of pernicious anæmia were seen, but the number was very small; on the other hand, an appreciable number of cases of leukæmia occurred, and there are certain points of interest with reference to these cases. Thus only one case of the more common form of the disease—i.e., chronic spleno-medullary leukæmia—was seen; all the others were instances of acute leukæmia of more or less sudden onset and rapidly fatal after an illness of only a few weeks, and often of only two or three weeks.

These cases were of a very uniform type, characterised by moderate fever, great weakness and prostration, often of sudden and always of rapid development, with an intense and very characteristic pallor, and generally some purpura. In some cases the occurrence of purpura was the first sign to attract attention, but more usually it was found on examination in a patient who reported sick owing to rapid prostration and loss of strength. The purpura was usually moderate in degree, but not infrequently it was of the type of purpura hæmorrhagica, and hæmaturia, sometimes profuse, and epistaxis were the most common forms. Hæmorrhage from the bowel also occurred. The purpuric eruption in the skin was of the usual type, but I was struck with the frequency of the presence of purpuric spots in the face, a phenomenon that is usually regarded as very exceptional. Purpuric hæmorrhages in the gums and in the tongue were also not uncommon, and some of the cases suffered from the severe stomatitis and sloughing of the gums that is such a well-known feature of the disease. All the cases showed the well-known and characteristic changes in the blood, such as the very great diminution in the number of the polymorphonuclear cells and the enormous increase in the number of large transitional lymphocytes with a large nucleus. I saw no case of acute leukæmia where the increase and number of white cells was due to an increase affecting only or mainly the small lymphocytes. The glandular enlargement was usually moderate and never extreme, and clinically the spleen was either not enlarged or only to a moderate degree. On post-mortem examination the thymus was in all cases persistent and enlarged.

It is of interest that so far as my experience went acute leukæmia, and especially that form of it characterised by purpura, was seen much more frequently than the ordinary forms of leukæmia.

An Obscure and Rare Disease.

In relation to this blood disease mention may be made here of an obscure and rare disease that was seen in two and possibly in three instances.

This malady was characterised by a febrile illness, somewhat resembling in its gradual onset and clinical course enteric fever. This similarity was shown not only by the gradual onset and the character of the temperature chart, but also by the occurrence at the onset and in the first few days of illness of some diarrhœa. The pyrexia was considerable, reaching 103° F. in its daily oscillations. The pyrexia lasted several weeks, during which the spleen slowly and gradually increased in size, and in at least two cases not only reached the middle line of the abdomen but passed well beyond it. The splenic enlargement was quite comparable to that seen in ordinary cases of spleno-medullary leukæmia. The patient presented no marked symptoms beyond those due to the pyrexia and a moderate degree of anæmia. Blood examination revealed a condition similar to that seen in splenic anæmia, a diminution in the number of red cells, and a considerable leucopenia, the white count falling to 3000. Repeated examination of the blood and stools failed to detect any organisms of the enteric group, and the Widal reaction was also uniformly negative.

The cases presented considerable resemblances to those of splenic anæmia, pyrexia, great splenic enlargement, anæmia, and leucopenia, but this diagnosis can scarcely be correct, since after an illness of many weeks the pyrexia declined and the spleen slowly returned to its normal size. One such case was not only watched throughout the illness, but it was ascertained that he was quite well one year after leaving hospital. The nature of these cases is obscure, as it would seem that enteric fever, splenic anæmia, and certain tropical affections could all be excluded, as not only was the search for parasites negative, but the cases were seen in young soldiers who had only served in France.

SALARIES OF SCHOOL MEDICAL OFFICERS.—At the last meeting of the Devon Education Committee it was decided to appoint a subcommittee to consider the question of the salaries of the medical staff. The Devon Education Committee some time ago decided to give their medical officers £410 per annum, but owing to resignations they have had to give a locum tenens 10 guineas a week, or £520 a year. The chairman said that they could not get medical officers for £400 per annum, and another member remarked that the salaries would have to be increased. Eventually the subcommittee was appointed, and it appears that the Education Committee will in the future have to pay the usual salaries given to school medical officers.

HOSPITAL TREATMENT OF THE PSYCHOSES AND PSYCHONEUROSES.

SUGGESTIONS FOR BRINGING THEM WITHIN THE SCOPE OF A GENERAL SCHEME.

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THE following suggestions are concerned particularly with patients other than in the metropolis who are either of the usual hospital class or not able to pay more than from two to five guineas a week, most of them only able to pay such fees for about six months. Under the designation "psychoses" would be comprised the various varieties of mental disorder, mainly in an early phase. The psychoneuroses would be illustrated by the borderland states, with mixed mental and "nervous" manifestations; psychasthenia or neurasthenia, with obsessions or imperative ideas; morbid doubts and fears; tics, with psychical perversion; psychoses associated with disorders such as Graves's disease or chorea; mixed nervous and psychical disorders after mental or physical shock; psychoses associated with minor epilepsy. All these conditions are accompanied by physical reduction, more or less in degree. Those interested in neurology (with which these suggestions are not concerned) may consider that its claims to be dealt with under a general scheme require to be pressed.

The medical requirements of cases of the psychoses and psychoneuroses have never been adequately met in this country. The time would seem opportune, I would fain say propitious, for insistence and persistence on their behalf. Greatly daring I shall scarcely be if I maintain that these patients constitute the most neglected section of the sick community. How could they be comprised in such a scheme as has been sketched in the Interim Report of the Consultative Council on Medical and Allied Services? In view of the stepmotherly treatment which has been meted out to patients suffering from these maladies hitherto, those whose practice lies amongst them have, no doubt, perused the Report, and especially with a view to ascertaining whether their claims to benefit under the projected scheme have been adequately dealt with. On consulting the Report it will be seen that the only reference made to mental disease is under "Supplementary Services" (pars. 14 and 74). Amongst these services come "hospitals for curable or incurable mental disease." So that the patients now referred to would merely be provided for in a supplementary fashion, together with, for instance, cases of tuberculosis, of infectious disease, and of epilepsy suitable for colony care. Incurable mental disease could be adequately provided for thus, but not curable. The psychoses and psychoneuroses together constitute a vast and oppressive liability, which, I maintain, cannot be discharged through the medium of a mere supplementary service. They were long since shunted on to the sidings of the main traffic of disease, where they have remained, mainly stationary. They, with their medical and nursing services, have long suffered, and still suffer, all the evils of segregation. What is now suggested amounts to a perpetuation of these evils in a milder form. Being at present outside medical society, it is proposed to admit them to its fringe. I would claim, with the full blatancy of the most truculent of trade-union leaders, "full recognition" for them; full provision, alike in primary, secondary, and teaching centres. I affirm that no adequate reason against their inclusion in any way worthy to be set against their crying needs can be adduced.

Application of the Three-centre Scheme.

One may conceive cases of the psychoses and psychoneuroses as occurring in a certain area, and provision being made for them under the general scheme of the Interim Report as follows (existing buildings, modified or enlarged, to be used for the present; the psychiatric clinic would require to be a new building):—

(*a*) In a rural district, where the most modest requirements of an indoor clinic or hospital are scarcely available and the needs of patients would have to be met under the next heading.

(*b*) In a small town able to furnish a building worthy to rank as a hospital (primary centre). Here there would be comparatively modest equipment for diagnosis, clinical laboratory work, and medical and surgical treatment.

(*c*) In a large town containing a hospital in an adequate sense, with visiting medical staff, some with training in special directions; a resident medical officer or two; some of the nurses specially trained in various directions, with one or two capable of conducting, with some tuition, a class of Swedish exercises; with masseuses; with laboratory facilities of a fairly extensive kind and technical apparatus; with out-patient department—in fact, a hospital equipped with everything entitling it to rank as a secondary centre.

(*d*) In the town wherein is situated a medical school, with its associated hospital, research and laboratory workers, teaching facilities, and consultants; the teaching or tertiary centre, to wit; the *ne plus ultra* when the lacking clinic in psychiatry, complete internally, with its out-patient department in association with other like departments of the hospital, shall have been established.

Those who have experience, be they general practitioners or specialists, of the difficulty and inappropriateness of dealing with—I will not say treating—these patients in their homes will fully appreciate how much the application of the three-centre scheme will mean to them. In my judgment, the first desideratum is to get them away from home surroundings and from relatives. Is there any class of invalid to whom this applies with equal force? Solve this difficulty by providing for these cases on the three-centre system, and their treatment is at once placed on a sound footing, and the haunting fear of the alternative to home—the asylum—will fade, treatment will commence in reasonable time, and less will be heard of the need for extending asylums. In making such provision, regard must be had to special requirements. Whether cases of the psychoses and psychoneuroses are received under (*b*), (*c*), or (*d*) of the above scheme, they will require facilities under the following headings:—

A room or ward so arranged, supervised, and administered, that means of self-injury are reduced to a minimum; one or more single rooms for isolation; a nurse or nurses, trained in mental disorders (preferably with general training also; the combination is more and more to be found); one or more masseuses, according to requirements; facilities for open-air rest in bed, for regular weighing; douches, open baths, available for prolonged warm-bath treatment—under (*d*) baths maintaining a constant level and temperature; a garden for exercise and occupation; facilities for indoor occupation, especially handicrafts—under (*d*) suitable shops, sewing-room and gymnasium, and other facilities for treatment under this special heading, which need not be specified here.

As regards *diagnosis and medical advice*, the principal and second medical officers of the nearest public mental hospital should be available for consultation, as also the director, or one of the staff, of the nearest psychiatric clinic. I would suggest that the domain of the psychoses and psychoneuroses is quite peculiarly one in which the general practitioner finds himself, and will continue to find himself, in need of expert advice, and that he will not commonly take the sole responsibility of deciding how the patient should be disposed of. I think a special case can be made out for an arrangement under the general scheme, with the agreement of the controlling authorities of mental hospitals and psychiatric clinics, whereby a reasonable fee is payable to the staff of these institutions for this consultative work out of local or State funds, in cases where the patient has no means. In suitable cases, and where distance allows, the patient can be sent by his doctor to the out-patient department of the nearest psychiatric clinic, or of the nearest mental hospital, should such department exist at the latter, and advice as to his disposal be thus obtained. However obtained, expert advice could decide whether the patient should be dealt with in hospital under (*b*), (*c*), or (*d*); whether—exceptionally—by reason of the gravity of his symptoms, notwithstanding their recent origin, or of insufficient accommodation being available under (*d*), the case should go to a mental hospital. When the case falls to be treated under (*b*), his own doctor should look after him, whenever possible, expert advice being available. Under (*c*) the patient will be under the care of a member of the visiting staff. Expert advice in this instance will, for a time, only be available from the mental hospital and psychiatric clinic, the senior staff being placed

on the visiting staff of the hospital. But these clinics will in time furnish specialists for the large towns, who will be on the staffs of the hospitals with psychiatric wards. The consulting work of the district would be done by the director of the clinic and by these specialists. As consulting work is an essential part of the recommendations of the Interim Report the need for clinics in psychiatry, in this instance for the training of consultants, is once more emphasised.

It is highly desirable that patients who are convalescent from the maladies here dealt with—and no doubt the same is true of most diseases—should not return direct to their homes, but through a convalescent home or sanatorium. Recuperative centres are, I observe, recommended (para. 74) in the Interim Report.

Illustrative Cases.

The following brief descriptions of patients dealt with by me at the newly established out-patient clinic in psychiatry of King Edward VII. Hospital, Cardiff, within the last two months may afford examples of cases susceptible of care and treatment on the lines indicated. It will be observed that all should have sought advice much earlier. The provision of rational facilities for care and treatment should go far to remedy this drawback.

Cases 1 to 6 could be treated under heading B or C of the above scheme.

CASE 1.—A. B., male, aged 25, single; commercial traveller. Mother had epilepsy. Five years ago attack of "religious mania" and in the county asylum for three months; remained well till two years ago, when he became "altered," but was able to go on working; present condition dates back three months; at present shows some exaltation; writes lengthy letters to distinguished people; believes himself to be a person of some importance; tends to restlessness; is forgetful, and unable to apply himself; quarrels with his employers; there is evidently general physical reduction. Is a candidate for an attack of mania unless promptly cared for. At present can only be treated at home.

CASE 2.—C. D., female, aged 20, single; domestic servant. No noteworthy history of mental or allied disorders in family. About three years ago, whilst in a situation, was taken advantage of by her employer. Had a child in consequence (two and a quarter years ago); went "strange" and has been "strange" since. About 18 months ago said to have had what appear to have been choreiform tremors in the left limbs. Mother states that the girl tried to strangle herself three weeks ago; also took some poison; said to be impulsive and vicious. At the present time tremors in all limbs, more marked in the left hand; probably most of the tremor removable by psychotherapy. Considerable physical reduction, morbid doubts and fears, with associated depression, and a considerable neurotic element. Patient very desirous of being admitted to a hospital; begged not to be sent home; recognised she was a burden to her mother, who had already sent her once to a union infirmary, for lack of a more suitable place. At present can only be treated at home.

CASE 3.—E. F., male, aged 25, single; coal-tipper. No noteworthy history of mental or allied disorders in family. Well and able to earn his living until June, 1919, when he met with a severe accident, sustaining compound fracture of the femur; the mental condition is referred back to this. Father states that patient was normal during puberty and adolescence, although rather backward at school; has left club-foot.

Present condition dates since last Christmas; gradually became depressed, crying for a trifle; morbid anxiety and fear; lack of energy; restarted work ten weeks ago, but unable to continue; thinking people staring at him, that he was of "no use"; afraid to see others; talking to himself; sleeping irregularly, and capricious re food. Physically much reduced; marked tremors of tongue and of facial muscles when speaking. Wassermann in serum negative. Present mental condition is one of partial dementia.

There happened to be a hospital in his district, and it was recommended that he be taken in there and treated by his medical man, who referred the case to the out-patient clinic, with occasional reference to me, although the facilities available at the hospital are not all that could be wished.

CASE 4.—G. H., male, aged 40, married; engine-driver. No noteworthy history of mental or allied disorders in family; states that he has had slight attacks of nervousness and "lowness" the past four or five years at different times, but he has never had to leave work. Present condition dates to about six months ago, and is ascribed by the doctor to influenza followed by a rather severe attack of pneumonia; more or less since then has complained of inability to attend to work, to take responsibility; inability to remember; feelings of depression, with loss of interest in work; sleep and appetite have been failing.

The present state may be described as psychasthenia; he complains of various morbid sensations in various parts of his body, and these can be suggested to him; is in a state of doubt and anxiety; says that everything is "closing in"; is entirely introspective; believes that his condition is traceable to masturbation in youth; says he would sooner be dead if his condition is incurable. Physically considerably reduced.

There being a hospital in his district (with the same limitations) the same recommendation was made as in Case 3.

CASE 5.—J. K., female, aged 20, single. Occupation nil. Family history: Mother states she has had five miscarriages (from six weeks to six months); no evidence of syphilis; one brother, aged 22, of the patient had a "nervous breakdown," for which he was discharged from the army; one brother (? the same), had night terrors; otherwise no noteworthy history of mental or allied disorders in family; mother observed to have malformed incisors of upper jaw, the teeth projecting to a marked degree. Patient described as having been late in learning to walk, but not in any other respect; also had night terrors earlier in life. Menstruation commenced at the age of 12; the present condition is worse at the menstrual periods. This attack (the first) is traced to overwork or mental strain in a clerical office, together with an attack of influenza. In August, 1918, matters came to a climax; it was noticed that she was unable to do her work; the present condition has lasted, off and on, since then. The hard palate is decidedly narrow and vaulted. The anterior nares are extremely narrow, the left is almost occluded; patient very pale and looks reduced; the mother states she has lost weight.

The present condition is one of marked confusion and disorientation; her conversation is jerky and inconsequent, at times almost incoherent; she is restless and fidgety; unable to fix attention; occasionally laughs and mutters to herself; at times is impulsive, and has thrown articles whilst at the dinner-table. (The condition is not one of dementia præcox.) She makes frequent reference to her relationships with some youth she appears to have met, and this circumstance may have played its part in precipitating the attack. The treatment at home, under the best conditions available, is producing a gain in weight, and otherwise giving indication of favourable results.

CASE 6.—L. M., female, 41, married; housework. As regards family history, two brothers are stated to have died of convulsions when a month or two old; one sister to have died of the same. The patient herself was a somnambulist as a girl; once walked up the street at night in an unconscious state. This attack (duration three to four months) stated to have followed influenza; menses still regular; the patient now complains of various morbid sensations, such as "swellings in the neck," "weakness of the legs," "machinery in the head"; these distract her attention and cause exasperation with uncontrollable impulse, so that she is reported to have put her head in a gas oven once and to have attempted to injure herself with a razor. At present can only be treated at home.

Cases 7 and 8 are probably best adapted for treatment under heading D.

CASE 7.—N. O., female, aged 19, lives at home. Mother states she had ten children; four died in infancy, two with seizures; one of the six living started fits aged 2 years, and had them rarely until aged 21; none since (now aged 26); paternal grandmother of present patient died in county asylum; paternal uncle now there; paternal grandfather committed suicide; intemperance in father's family; stated to be some consumption on the mother's side. Mother a very intelligent woman. The patient could have earned her living (as far as intelligence goes) had it been necessary; she started having fits three years ago at night and early in the morning rarely (only one to two weekly). Once had a series of them. The mother attributes the first seizures to shock due to an assault, apparently with attempt to rape; regular after the above, but for last two years amenorrhœa. Leucorrhœa since last May; was in the county asylum for a while last year. There is no marked mental deterioration. Transferred to the gynæcological clinic. Uterus anteroverted, possibly endometritis; treatment of the amenorrhœa suggested. Requested the gynæcologist to continue treatment for the present, and pass her back to the psychiatric clinic in due course.

CASE 8.—P. Q., male, aged 35-40; bank employee. Served in Mesopotamia during the war; no history of illness or wounds; no family history of mental or allied disorders admitted. First attack; always of a worrying temperament; present condition has been going on for several months; believes his books will not bear auditing; that they have been falsified by him; that this and similar dishonest deeds of his are about to be brought to light; the fear of what will happen to his family oppresses him; is entirely self-centred and incapable of attention; lies in bed moaning. The day before I saw him he wandered from home, returning late with his leg-coverings soaked; said he had walked into the sea, not having control of his actions; has no clear recollection of events. The usual general physical reduction exists, but no specific disease. Certified to a registered hospital for the insane, where he is going on well.

Conclusion.

If the psychoses are to be dealt with under a three-hospital system a modification of the Lunacy Laws will be necessary, and therefore the recent presentation in the House of Commons of the Ministry of Health (Miscellaneous Provisions) Bill, which authorises under Clause 10 the care and treatment of cases of mental disorder "incipient in character and recent in origin," notwithstanding the provisions of any existing Act, is welcome. I observe nothing in the proposals of the Minister of Health which would render impracticable the scheme of care and treatment herein outlined, though the observance of certain formalities, such as the notification of reception, the production on authorised demand of written consents and certificates, is likely to prove irksome and to cause resentment at the outset. No vivid imagination is needed to forecast the administration hereafter, in whole or in part, of a three-hospital system, under Clause 11 of the Bill, by local authorities. These should meantime be diligently advised to insist on provision under any such system for cases of the psychoses and psychoneuroses. Superintendents and administrators of hospitals might be well advised to contemplate their future responsibilities under the new order of things. The annual production of "consents" and "certificates" will be a bagatelle compared to the quarterly requirements of the representatives of the ratepayers.

LOBAR PNEUMONIA.

A CLINICAL ANALYSIS OF 558 CONSECUTIVE CASES.

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THAT one observer should have been privileged to see within two and a half years no fewer than 558 cases of lobar pneumonia is, I venture to think, sufficiently confirmatory of the view that medical officers during the past war were afforded exceptional opportunities to practise medicine upon an intensive scale. I have selected for consideration a disease which is particularly suitable for statistical investigation. Lobar pneumonia presents features which make a correct diagnosis a matter of practical certainty; it occurs sufficiently frequently to provide a conveniently large number of figures from which to draw conclusions; and as regards incidence no special peculiarities of military life can be said to vitiate comparisons with its occurrence in civil practice. From the personal standpoint it is a matter of some importance that every case was seen from the first day (and generally from the first hour) of its arrival in hospital, and that the progress throughout to its termination was systematically investigated. For these reasons errors of observation became reduced to the lowest possible limits—the errors of observation of one clinician; whilst the circumstance that the treatment of every case was actually ordered or personally supervised by the same person removes any implication as to individual skill, and so affords an indication as to the dependence of mortality upon details which relate solely to the patients themselves.

I have excluded a few cases which occurred in the Aldershot Command which were probably cases of lobar pneumonia but about which some doubt in the diagnosis remained to the end, and no case is comprised in my series which could not according to accepted criteria be legitimately included. The investigation terminated suddenly in October, 1917, on my transference from the Aldershot Command when urgently mobilised for service overseas; and on my return to the Command for the rest of my military service the supervention of the influenza epidemic, with its anomalous pulmonary complications, rendered it impossible to differentiate unequivocal cases of true lobar pneumonia.

It must be admitted with regret that all the advantages afforded by this unique opportunity were not realised. Attention was from the outset particularly directed to clinical features. Much might have been done, however, to trace the connexion between incidence and climatic peculiarities, seeing that a selected body of men living under identical conditions was under consideration. Undoubtedly, had adequate meteorological observations been utilised many interesting facts would have emerged. But in the earlier months of the investigation such possibilities were not appreciated. Furthermore, statistical inquiries during the war were not only discouraged but rigidly forbidden. It was, in fact, only recently that I was enabled to procure the necessary information as to the number of troops actually serving month by month in the Command during the period comprised. To have proceeded further in an endeavour to elicit certain details relating to individual units would at that time have demanded opportunities which for many reasons were not forthcoming. The exigencies of military service regarded a home hospital as mainly a pied-à-terre or distributing centre for medical officers proceeding overseas; the minimum of skilled assistance was therefore available, so that elaborate investigations of the patient's family history, past life, and other personal details were necessarily neglected. For the same reason pathological work was at this time reduced to the lowest possible minimum, and the frequent changes in personnel precluded any systematic research.

For these reasons, then, my contribution is almost entirely clinical; nevertheless, I think the investigation of so large a number in so comparatively short a time may not be without interest and perhaps value, more especially when it is emphasised that conclusions are based upon cases drawn from a relatively selected population as regards age and physique, all living under practically identical conditions.

Incidence.

Table I. illustrates the incidence of cases month by month and at the same time comprises the distribution according to age. The average strength in the Command is also exhibited in order that the proportion of cases to total population can be scrutinised. The table also shows the mortality according to incidence, and briefly analyses the death-rate throughout the series according to the age of the patients.

A contemplation of this table leads to some rather bewildering and at first sight inexplicable results. In the first place, it will be seen that there is no evidence of a regular seasonal incidence. It is difficult to explain the large number of cases encountered in May, 1915, a preponderance which is not apparent in the corresponding month in 1916 and 1917. Contrast also April, 1916, with April, 1917, and, as an even more striking example, November, 1915, and November, 1916. One might have suspected as a possible explanation of the fluctuating numbers corresponding variations in the total number of troops present in the Command, but the figures which I have recently obtained show that such variations do not run pari passu with the incidence of the disease. The incidence must have depended upon a large number of different circumstances—possibly climatic conditions, temperature, humidity, prevailing winds, and so on, with which I am unable to deal. Above all, I am convinced that the incidence must have depended largely upon the physique of the troops stationed in the Command, which certainly varied enormously according to military exigencies. Had it been possible to take an exhaustive survey of the troops, particularly as regards

TABLE I.—*Incidence and Mortality according to Age and Season.*

—	Under 20.	20-30.	30-40.	40-50.	Above 50.	Total cases.	Monthly strength of Aldershot Command.	Deaths.
1915								
April	8	4	8	—	—	20	134,670	[illegible]
May	11	32	4	4	—	51	113,482	5
June	12	22	14	—	—	48	154,081	4
July	6	11	7	1	—	25	121,106	[illegible]
Aug.	7	5	4	2	—	18	97,647	2
Sept.	6	5	7	4	—	22	92,897	3
Oct.	—	6	10	—	—	16	121,531	1
Nov.	11	17	2	[illegible]	—	38	125,203	[illegible]
Dec.	6	5	5	5	—	21	123,727	1
1916								
Jan.	7	3	9	2	—	21	129,332	0
Feb.	1	11	11	1	—	24	117,733	[illegible]
March	9	7	2	—	—	18	102,427	1
April	2	4	1	2	—	9	120,794	0
May	2	4	2	2	—	10	111,949	1
June	1	3	3	1	1	9	100,108	[illegible]
July	4	1	4	2	—	11	115,883	[illegible]
Aug.	10	12	3	—	—	25	110,842	2
Sept.	4	9	—	—	—	13	99,217	0
Oct.	1	4	4	—	—	9	111,965	1
Nov.	1	6	1	1	—	9	119,490	3
Dec.	5	7	9	2	1	24	112,981	[illegible]
1917								
Jan.	2	3	5	1	—	11	112,971	[illegible]
Feb.	4	11	10	1	—	26	97,137	[illegible]
March	6	5	7	1	—	19	90,342	2
April	9	6	4	3	—	22	101,622	[illegible]
May	3	4	5	3	—	15	111,538	1
June	4	1	1	—	—	6	114,358	1
July	1	5	1	2	—	9	109,448	[illegible]
Aug.	4	—	1	—	—	5	106,906	[illegible]
Sept.	1	—	2	1	—	4	107,247	0
Total	148	213	146	49	2	558	—	61
Deaths	9 (6·1%)	21 (9·9%)	20 (13·7%)	9 (18·4%)	2 (100%)	61 (10·9%)		

their category, I feel no doubt a definite relation between susceptibility and constitution would have been definable.

It is easy to explain the curiously high incidence in August, 1916, when no fewer than 25 cases occurred. During this month a Canadian contingent was transferred direct from Canada to the Command, and the change of climate appeared to have been badly resisted, for of the 25 cases 18 were Canadians. (The cases were typically croupous pneumonia, and there was no question of an influenzal element.)

My conclusion as regards physique is supported by a consideration of the length of service of men affected. Of course, the army during the recent war consisted for the most part of men who had seen no previous service, so that by April, 1915—when my investigations at Aldershot were begun—a huge majority of men in the Command possessed less than eight months' service, and throughout the war recent recruits dominated the strength of the Command. Nevertheless, these observations extended to September, 1917, by which time the war had been over three years in progress, yet the striking fact is obtained that of the total cases seen no fewer than 62 (i.e., 11 per cent.) fell sick with the disease *within 12 days* of joining up; 119 cases (21·3 per cent.) in less than one month from enlistment; 227 (50 per cent.) in less than six months; whilst, finally, no fewer than 523 cases (93·7 per cent.) had had less than 12 months' service. I suggest that the change to military conditions—exposure, overcrowding, and other factors inseparable from army life—naturally determined this susceptibility of the more feeble.

Detailed descriptions of general physique are not forthcoming, and I can only give a general impression in stating that over and over again I was greatly struck by the wretched development of the recruits who came in sick.

It will be observed that only two men over 50 are included in the series—one would naturally encounter few men of this age—and that both succumbed. The service of one man was 13 months; of the other 15 months. The total mortality (10·9 per cent.) compares favourably with the mortality encountered in cases of pneumonia occurring in the general population, which in 1065 cases collected in 1884 by an Investigation Committee[1] amounted to 1 in 5·5—i.e., 18·2 per cent.

Of 673 cases which occurred in the Middlesex Hospital between 1880 and 1889 116 died—i.e., 17 per cent., and annual variations between 12 and 24 per cent. were encountered. One would naturally expect a lower mortality in such a series of cases as the one now presented, for the men were to a certain extent selected, and, speaking generally, excluded the aged, debilitated, and alcoholic, and eliminated all the principal adventitious causes which contribute to fatality. My percentage of fatal cases constitutes an intermediate between the average population and a body of men scrupulously selected for their physique. Osler[2] quotes statistics of picked men in the German Army, where among 40,000 cases a mortality of only 3·6 per cent. occurred. (In the same place he gives the record of 658 cases occurring in 16 years at the Johns Hopkins Hospital with a mortality of 200 (30·4 per cent.))

Initial Symptoms.

In interrogating patients upon their arrival in hospital regarding the onset of their illness leading questions were at first as far as possible avoided and direct suggestions were subsequently put with reference to certain of the commonest symptoms. The following table of symptoms (Table II.) gives their numerical frequency and percentage of total cases.

Table II. calls for little comment. Pain in the side was generally, but not invariably, restricted to the side in which signs of consolidation subsequently appeared. Headache one would naturally expect to be of fairly frequent occurrence. In my series six suffered from pneumococcal meningitis, and in a further 25 cases the symptom was of such severity that a provisional diagnosis of cerebro-spinal fever was made and lumbar puncture performed.

A complaint of difficulty in breathing was very infrequent; bronchitis, as will be seen, was advanced as a definite initial symptom in 40 cases, and these, for the most part, were subjects who were chronic sufferers from chest trouble. In 13 cases the only complaint was of sore throat. Of the 9 patients who complained of

TABLE II.

Symptom complained of—	No. of cases.	Per cent. of total cases.	Symptom complained of—	No. of cases.	Per cent. of total cases.
Shivering	381	69·0	Pain in abdomen	31	5·5
Pain in side ...	345	60·0	Tonsillitis	13	2·3
Headache	196	35·6	Dyspnœa	11	2·0
Vomiting	181	33·0	Pain in legs ...	11	2·0
Cough...	132	24·0	Hæmoptysis ...	9	1·6
Pains all over...	50	9·0	Diarrhœa and vomiting	3	0·5
General malaise	42	7·6			
Bronchitis ...	40	7·0			

hæmoptysis one was a case of trauma to the chest wall; and, bearing in mind the type of condition subsequently seen in the influenza epidemic, it is not altogether unlikely that three were of influenzal origin.

In 7 cases pain in the abdomen was so severe that they were sent in with the diagnosis of acute appendicitis. Three actually underwent operation for this condition, the appendix being found free from disease; and 3 others reached the theatre and underwent preparation for operation. In all these "abdominal" cases unequivocal signs of lobar pneumonia appeared in due course. From these figures it would appear that the simulation of acute appendicitis is not so common as is sometimes suggested.

Condition on Admission.

It is the usual practice in the army to transfer to hospital with the least possible delay all men who report sick with pyrexia, save of the most trivial character. In certain units provision is conveniently made for the isolation of the sick for observation, and, as is well known, a certain type of man regards it as infra dig. to report sick until he is in a state of complete prostration. With these few exceptions, however, the large majority of my series were admitted to hospital a short time after the onset of the illness. The accompanying table (Table III.) illustrates the condition on admission as regards the degree of pyrexia on their arrival in the ward.

TABLE III.

Temp. on admission.	No. of cases.	Per cent. of whole.	Temp. on admission.	No. of cases.	Per cent. of whole.
Below 98°	15	2·7	102°–103°	155	27·7
,, 100°	39	7·0	103°–104°	131	23·4
100°–101°	34	6·0	Above 104°	84	15·0
101°–102°	115	20·5			

The cases who exhibited a temperature below 98° were in a state of collapse, and with the rare exceptions of those who never rallied showed pyrexia of over 101° within six hours of admission. It will be observed that over 70 per cent. cases on admission showed a temperature between 101° and 104° and over 50 per cent. between 102° and 104°. A temperature higher than 105° was very infrequent, in three of my cases only.

Pulse-respiration ratio.—This is usually held to be typically about 3 : 1 in cases of lobar pneumonia. In my series, although variations were very frequent, in 80 per cent. of cases the pulse-respiration ratio was between 3 : 1 and 4·5 : 1. These figures are substantially lower than those given by Osler (2 : 1; 1·5 : 1) which I observed in about 12 per cent. cases only.

Knee-jerks.—A special investigation of this feature was made since it has been mentioned that loss of tendon jerks is a usual feature in lobar pneumonia and that the phenomenon affords a valuable method of differentiation from an acute abdominal condition. The knee-jerks were abolished in 138 cases (24·7 per cent.). They were feebly present in 69 cases (12·4 per cent.). They were present to a degree which might be described as normal in 248 cases (44·4 per cent.) and

they were definitely exaggerated in 103 cases (18·5 per cent.). I believe that the original observation (which I have been unable to trace) was conducted at a time when it was not customary to employ the now familiar "knee-jerk hammer," without which a considerable number of sluggish and even normal knee-jerks would be overlooked and so contribute to an apparently large number of cases of abolition of the knee-jerk. If the test is properly performed it would not appear that any diagnostic value can be said to be attached thereto.

Signs in the Chest.

The figures in Table IV. refer to the time of appearance of the earliest definite signs of consolidation, not suggestive features such as crepitations or slightly prolonged expiration. It will be seen that in nearly 80 per cent. cases signs appeared within four days of onset of

TABLE IV.—*Time of Appearance of Signs of Consolidation.*

Day of appearance.	No. of cases.	Per cent.	Day of appearance.	No. of cases.	Per cent.
Day of illness—			Day of illness—		
First	12	2·15	Sixth	32	5·7
Second ...	152	27·2	Seventh ...	24	4·3
Third	161	29·0	Ninth	1	—
Fourth ...	115	20·0	Signs completely absent	12	2·15
Fifth	49	8·8			

the illness. Although in 12 cases no signs of consolidation could be detected throughout the course of the illness these cases were from other features unmistakably cases of true lobar pneumonia.

Distribution of Areas of Consolidation.

It is, I think, generally agreed that the right lung is affected more frequently than the left. Osler gives in 100 post mortems: R. lung, 51 per cent.; L. lung, 32 per cent; both lungs, 17 per cent. These figures are a close approximation to mine (Table V.), which, it

TABLE V.

Area.	Cases.	Per cent.	Area.	Cases.	Per cent.
Right lower lobe	191	34·2	Left apex	[illegible]	1·4
Right apex... ...	64	11·5	Both lungs ...	115	20·6
Left lower lobe...	168	30·0	Signs absent ...	12	2·2

must be observed, however, correspond to clinical observations, not to more exact post-mortem findings. It is, further, universally maintained that the lesion of "double pneumonia" is more serious than when one lung only is affected. This is certainly supported by my series, for in 115 cases of double pneumonia 33 deaths occurred—viz., 28·7 per cent.—as compared with a mortality of 10·9 per cent. when all cases are considered.

Sputum.

Table VI. gives the day of appearance of typical rusty sputum. It will be observed that, as in the case of the time of appearance of physical signs, the second, third, and fourth days predominate. In quite a con-

TABLE VI.

Day of appearance of rusty sputum.	No. of cases.	Per cent.	Day of appearance of rusty sputum.	No. of cases.	Per cent.
Day of illness—			Day of illness—		
First	4	—	Sixth	48	8·6
Second	97	17·4	Seventh ...	19	4·5
Third	135	24·2	Eighth ...	6	
Fourth	123	22.0	Sputum entirely absent	61	10·9
Fifth	65	11·6			

siderable proportion of cases—viz., 10·9 per cent.—sputum was never evident, a large percentage in comparison with the cases in which physical signs were absent or rather not detected. Of 100 cases observed by Emerson 16 had no sputum or "very little."[2]

Herpes.

Herpes labialis—no other situation was observed—was seen in 95 cases—i.e., 17 per cent. Of these only four died (4·2 per cent.), once again confirming the popular impression that the prognosis is more favourable in cases when herpes is present. Geissler[3] observed it in 182 out of 421 cases (43·2 per cent.). Osler gives its occurrence as 12 per cent. (40 per cent.).

Termination.

Crisis.—This occurred in 315 cases, including 5 in whom death subsequently took place and 28 who developed empyema. Table VII. illustrates the day upon which crisis occurred, reckoning from the onset of symptoms.

TABLE VII.

Day of crisis.	No. of cases.	Per cent.	Day of crisis.	No. of cases.	Per cent.
Third	25	8·0	Eighth	30	9·5
Fourth	[illegible]	2·5	Ninth	16	5·0
Fifth	65	20·6	Later than ninth... ...	22	7·0
Sixth	36	11·4			
Seventh... ...	113	36·0			

I had gained the impression that termination by crisis was relatively less frequent in the Aldershot Command than elsewhere, but my percentage (56·5 per cent.) corresponds very closely to that given (60 per cent.) by Powell and Hartley.[4] Table VII. confirms the general acceptation that the seventh day is the commonest upon which crisis occurs and the ancient belief that the odd days predominate over the even days. I think it probable that the figures for the seventh day should be augmented at the expense of those given for the sixth and eighth days, as in many of these cases some uncertainty as to the day of onset of the illness was present.

Termination by Lysis.

In this connexion one must, in order to obtain figures for the frequency of lysis in uncomplicated cases, exclude not only the 315 cases in whom crisis occurred, but in addition 56 cases in whom death (antecedent to, or in the absence of, crisis) resulted, 88 cases when empyema developed, and 12 other cases with other complications in whom crisis did not occur. This leaves a residue of 87 cases—that is to say, lysis occurred in 15·6 per cent. cases without complication.

Complications.

Empyema occurred in 116 cases—i.e., 20·8 per cent. This is a proportion considerably larger than the general experience, for of 7394 cases investigated by Hector Mackenzie as regards complications,[5] empyema was present in only 3·48 per cent. Two circumstances explain the very large percentage in my cases. In the first place, I think there can be no doubt that empyema is relatively a very much more common complication in the Aldershot Command than generally. In the second place, empyema is probably very frequently overlooked because the diagnosis of "unresolved pneumonia" is accepted when physical signs persist in the chest and the patient's general condition does not suggest the presence of pus. Exploration of the chest was a routine proceeding at Aldershot; and whilst no undesirable effects ensued from the operation I am certain that empyema was ascertained and the duration of the illness reduced in many cases in which suspicion of its existence would not have been aroused. Finally, some of the cases included in my series would not be regarded as legitimately empyema in the restricted sense of thick pus (with or without organisms) demanding resection. Of my 116 cases 30 only required resection. In the remaining 86 cases aspiration only on one or two and rarely three occasions was found to be sufficient to cause complete resolution. Such a proceeding naturally cleared up those effusions of a thin serous character containing few pus cells or mononuclears only, but I was certainly surprised at the efficiency of this simple treatment when really thick pus was present, as in the other 60 cases, in 24 of whom

organisms (pneumococci or streptococci) were also identified. Resection was always adopted when it was manifest that extensive drainage was necessary, but I would recapitulate that 86 cases were successfully treated by aspiration alone, of which 26 exhibited thin fluid, usually hæmorrhagic and containing mononuclears and few pus cells; 36 thick pus, in which organisms were not demonstrable; and 24 thick pus, containing pneumococci or streptococci. The average period for complete recovery was so short as compared with that of a resection, even a thoroughly satisfactory one, that I am convinced as to the value of this form of treatment, provided the patient's general condition is carefully watched; and even if resection is regarded as desirable, I believe previous thoracocentesis to be an advantageous preliminary.

Among the 116 cases of empyema 23 deaths occurred —i.e., practically 20 per cent. In the series of 7394 cases already quoted the frequency of empyema is given at 3·48 per cent., with a mortality of 1·12 per cent. Even if one excludes the relatively trivial cases and admits only those with considerable pus formation, the occurrence of empyema in the Aldershot Command must have been relatively very high, at least 14 per cent., and the empyema death-rate then rises to 27 per cent., which approximates to the usual expectation. I must at this point express the conviction that influenza played no part in the production of empyema in this series. When the epidemic occurred the percentage of empyema in pneumonic cases was exceedingly high.

Other Complications.

Meningitis occurred in 6 cases—i.e., approximately 1 per cent. The infection in all was pneumococcal and a fatal result ensued in all. Meningismus (i.e., a condition suggesting the possibility of meningitis of some form or other and for which lumbar puncture was performed) occurred in no fewer than 25 cases (i.e., 4·5 per cent.), all of whom recovered.

Pericarditis was discovered in 11 cases only (i.e., 2 per cent.), which is little more than half the percentage given in the big series above referred to and less than half in that of Osler (35 out of 658). Four of the cases died (i.e., 36 per cent.), a much lower figure than that given in Dr. Mackenzie's cases, in which the mortality is just over 70 per cent., and still lower than Osler's 89 per cent.

Infective endocarditis was encountered in 4 cases (0·72 per cent.), which corresponds closely to Dr. Mackenzie's 0·83 per cent.—all 4 cases died.

Of less serious complications or accompaniments *jaundice* was prominent in 7 cases, *arthritis* in 2 cases, *nephritis* in 2 cases, *colitis* in 1 case, and extensive venous *thrombosis* in 1 case. *Delirium* was a very prominent feature in 22 cases (4 per cent.) and 3 cases were actually admitted as cases of acute mania. Among other complications referred to by Dr. Mackenzie, none of which were observed in my series, are peritonitis (0·31 per cent.); otitis media (0·33 per cent.); parotitis (0·05 per cent.); and peripheral neuritis (0·05 per cent.)

Finally, it may be noted that of the 61 deaths 23 occurred in cases with empyema, 6 in cases with meningitis, 4 in cases with pericarditis, and 4 in cases with infective endocarditis. These complications were duplicated on some occasions, so that 28 deaths took place in cases free from any complication.

I am indebted to so many colleagues for their valued assistance that a general expression of gratitude must suffice, but I cannot refrain from a special reference to Dr. Herbert French, late Lieutenant-Colonel, R.A.M.C., and consulting physician to the Aldershot Command, for his generous advice and encouragement and assistance during the greater part of this research.

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AN EXPERIMENTAL STUDY ON THE ORIGIN OF IDIOPATHIC NEPHRITIS.*

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OUR knowledge of the ætiology of parenchymatous nephritis is largely based on clinical experience. It is a familiar fact that an acute nephritis may arise in the course of many specific infections, and the production of nephritis by various chemical agents has been the subject of numerous experiments. But such modes of origin are notoriously difficult to account for the majority of cases of acute and chronic parenchymatous nephritis admitted to hospital. Hence the designation "Idiopathic Nephritis" still remains as a term of reproach in our text-books.

Bacteriological examination of the urine from cases of acute nephritis has, in the hands of Scheidemandel[1] and others, shown that pyogenic bacteria are occasionally responsible for the disease. In such cases *Staphylococcus aureus*, streptococci, and *Bacillus coli* (the last in insufficient numbers to cause obvious bacilluria) have been obtained on culture of the catheter urine. The causal relationship of these organisms is shown by their disappearance from the urine on recovery of the patients and by confirmatory blood cultures in severe cases. Clinically, the more obviously septic cases are characterised by fever, tenderness in one or both loins, and the appearance of numerous leucocytes in the urine; but in milder forms the picture may be that of a diffuse nephritis.

In chronic cases of parenchymatous nephritis the urine is usually sterile. But in view of the work of Hort,[2] who employed the urine itself as a culture medium in cases of obscure general infection, I resolved to use incubated urine from a series of cases of nephritis and inject it into animals in the hope of reproducing the disease. At the same time, cultures of this or other material would check any results obtained. This mode of experimentation was based on the assumption that cases of idiopathic nephritis are due to some unrecognised infection of the kidney and that the causative organisms are present with the products of inflammation in the urine and in the kidney itself.

Experiments with Renal Substance.

Soon after the beginning of this investigation I was able to secure a kidney from a patient who had died of acute nephritis complicated by pleurisy with effusion (Case No. 10300). Dr. Yussef Barrada, medical resident at the hospital, had shown a keen interest in the work, and removed the kidney aseptically within two hours of death.

Portions of this organ were at once placed in tubes of sterile liquid serum, while another piece was ground up with normal saline.

Fresh emulsion.—The emulsion in saline was injected into the peritoneal cavity of a guinea-pig. This animal survived, and no albumin could be detected in its urine.

Culture in liquid serum.—These tubes were kept in an incubator for two days and then in a warm room for 15 days. 1 c.cm. of the fluid from one tube was then injected intraperitoneally into guinea-pig (A). The animal died in six days. Autopsy showed effusion into both pleuræ, and some lymph adhering to the liver and covering the spleen, which was greatly enlarged. The kidneys were congested, and on section showed marked degeneration of the tubular epithelium with casts in situ.

From the organs of the dead pig and from the material injected pure cultures of a very short Gram-negative bacillus were obtained; they were shown to be identical by the sugar reactions.

Subcultures.—From another tube of serum in which a piece of the human kidney had been placed a subculture was made on blood-agar. This showed a growth of the same bacillus described above, with some yeast cells. The growth when a week old was washed off with sterile saline; half was injected into a pig (B), the rest was passed through a Berkefeld filter and at once injected into the peritoneal cavity of another pig (C). Pig (C) injected with the filtrate showed a trace of albumin in its urine, but recovered. Pig (B) showed distinct albuminuria and died in seven days. The

* A paper read at a meeting of the Staff Club, School of Medicine, Cairo.

post-mortem appearances were the same as in pig (A). The kidneys showed an acute hæmorrhagic nephritis. Cultures from the heart, blood, and organs recovered the bacilli without yeast cells.

A pure culture was obtained from plating the original subculture and small doses were injected subcutaneously into a white rat and into a guinea-pig. The rat showed distinct albuminuria by the third day, but no albumin could be detected in the alkaline urine of the pig. Both animals were painlessly killed on the fourth day. Agar cultures of the heart blood, kidney, and urine were sterile in each case. Sections of the kidney in both animals showed cloudy swelling of the convoluted tubules with intratubular debris, much hyperæmia, and occasional hæmorrhages.

Passage.—An agar culture from the kidney of pig (B) was emulsified and injected into two other pigs (D) and (E). Pig (D) was injected intraperitoneally and died the next day. The spleen was very greatly enlarged and the kidneys showed acute degeneration of the tubular epithelium. Pig (E) was injected subcutaneously and died in five days. No albumin could be demonstrated in its urine during life. Post-mortem the spleen was enlarged, but there was no lymph adherent to it or to the liver as in all the other pigs dying after intraperitoneal injection. The kidneys showed a conspicuous degeneration of the tubular epithelium. From both pigs the original bacillus was recovered.

The culture obtained from the original pig used (Pig A) was subcultured four months later and grew well. A guinea-pig was injected subcutaneously with a small dose and was killed a fortnight later. From this pig bouillon cultures were taken of the urine (obtained at autopsy from the bladder) and from three pieces of a kidney. The urine and two of the kidney tubes yielded a pure culture of the bacillus injected; the remaining tube was sterile.

The other kidney and a portion of the liver were sliced and fixed in Zenker's fluid. The kidney on section showed a striking degeneration of the epithelium of the convoluted tubules with casts in situ. The liver changes were remarkable; there was widespread necrosis of the cells and hæmorrhages into the liver substance.

Summary.—In this case the features of the disease in the human patient were successfully reproduced in animals. The causative organism was obtained in pure culture and recovered after passage through two sets of animals.

Investigation of Urine.

Material for this work was obtained from 25 consecutive cases of parenchymatous nephritis admitted to my wards. These patients all showed general œdema, often extreme, with albumin and numerous casts in the urine; the more important features of each case are tabulated below. The clinical history elicited was often meagre, but in two cases examination showed that the nephritis was undoubtedly syphilitic in origin. Apart from these two no definite cause for nephritis could be found on examination of the patients.

For the collection of urine from the patients the following technique was finally adopted:—

A sterile rubber catheter was passed with full antiseptic precautions; since male Egyptians are circumcised, one common source of contamination was absent. After some urine had been allowed to escape the catheter was temporarily compressed and its exit end well flammed. Some 10 c.cm. of urine were then collected in a stout sterile test-tube during momentary removal of a sterile rubber stopper. Afterwards the end of the tube and the stopper were again sterilised in the flame. Before the use of rubber stoppers contamination of the urine was liable to occur after some time, but the avoidance of cotton plugs overcame this difficulty. It is advisable to use a couple of tubes for each patient, one for incubation and culture, the other for direct microscopical examination of films prepared from the sediment, both fresh and stained by Gram's method.

According to the results of experiments and bacteriological examination of the urine these cases of nephritis may be arranged in four groups (A, B, C, and D).

Group A.—These urines showed a considerable excess of pus corpuscles (as well as casts), and bacteria were readily found on direct microscopical examination of the fresh deposit.

(*a*) In the male patients (first 5 cases) this complication was due to a septic cystitis following bilharzial disease of the bladder. In ordinary cases of bilharziasis the discharge of ova gives rise to hæmaturia only, and the urine is sterile. But in long-standing cases a bacterial infection is apt to follow, and often persists after the bilharzial worms have perished. Although a septic extension to the kidneys may terminate such cases, this rarely presents the picture of an ordinary parenchymatous nephritis, and in the examination of over 400 patients suffering from bilharzial disease of the bladder, many of whom had pyuria, I only found one urine containing renal casts, and this man had developed dropsy. Hence, bearing in mind the extraordinary incidence of bilharziasis in Egypt and the comparative rarity of parenchymatous nephritis, there does not appear to be any close relationship between these diseases.

(*b*) In the three female cases there was no evidence of bilharziasis. One patient (Case No. 10741) had obvious colon bacilluria; in the second (No. 11203) there was a pyuria of doubtful origin (tubercle bacilli not found), while in the third (No. 702) a malignant growth of one kidney was found post mortem. But as all three patients showed the usual symptoms and signs of parenchymatous nephritis they have been included in the list.

Injection of these urines, especially after incubation, was generally fatal to guinea-pigs. The animals succumbed in a few hours to a septicæmia, and from their blood and organs the causative bacteria were recovered. Direct examination of the urinary sediment and of cultures taken showed in most cases a mixed infection, in which Gram-negative bacilli predominated. Very different types of these organisms were found in the different urines, together with Gram-positive bacilli and cocci in some instances.

Group B.—These cases of nephritis were complicated by urinary bilharziasis, but without signs of any septic infection. The urine contained abundant casts, some blood corpuscles, and bilharzia ova more or less embedded in cells, chiefly eosinophiles. The fresh urine was sterile and appeared innocuous on injection into the peritoneal cavity of a guinea-pig. But after a short period of

	Case No.	Age.	Duration of œdema.	Examination of urine.				Remarks and complications.
				C.cm. per diem.	Alb. per 1000.	Pus.	Growth.	
A	7286	29	6 mos.	1000	6	+++	Mx.	Cystitis.
	8934	31	3 wks.	400	15	++	Pos.	—
	2862	30	4 mos.	600	4	++	Mx.	—
	599	24	5 ,,	1700	4½	+	,,	—
	10774	20	1 wk.	1000	13	+	Pos.	Syphilis.
	10741	25	3 mos.	900	9	+	Mx.	Bacilluria.
	11203	30	4 ,,	600	½	+	,,	Fever.
	702	50	2 ,,	500	7	+	,,	Malignant growth.
B	11082	25	4 wks.	2000	4	+	Pos.	—
	10821	15	4 ,,	500	1½	+	,,	Amœbic dysentery.
	2136	40	10 mos.	2500	6	+	,,	—
	3360	22	4 wks.	1400	3½	+	,,	—
C	10300	28	3 wks.	400	6	0	,,	Pleurisy; died.
	1814	6	10 dys.	250	1	0	,,	Banti's disease.
	1946	30	10 wks.	400	3	0	,,	—
	2021	25	2 mos.	1000	1	0	,,	Malaria; ankylostoma.
	2179	20	1 yr.	800	9	0	,,	Bronchitis; ankylost.
	5170	10	5 dys.	450	1½	0	,,	Fever.
	10701	30	5 mos.	1000	10	0	Om.	—
D	303	65	2 ,,	300	5½	0	Neg.	—
	4107	65	4 wks.	600	3	0	,,	Bronchitis.
	4621	37	3 ,,	1200	3½	0	,,	—
	3079	27	3 yrs.	700	31	0	,,	Syphilis.
	4397	24	5 mos.	800	¼	0	,,	Heart dilated.
	4666	40	3 wks.	750	3	0	,,	—

Mx., mixed. Pos., positive. Neg., negative. Om., omitted.

incubation the urine of the first two cases showed a growth of Gram-negative bacilli, and killed guinea-pigs in six hours with a dose of 3 c.cm. From the last two cases in this group Gram-positive bacilli were isolated, but grew feebly on agar.

Group C.—These urines showed no signs of any complicating disease of the urinary tract. Cultures taken from the fresh catheter urine were often sterile, but after the urine had been incubated for one day or longer a positive result was obtained. In all these cases the cultures showed a pure growth of short bacilli, Gram-negative and aerobic. Animals which died as the result of injection or had been purposely killed to ascertain the effect were found to have developed a distinct nephritis.

Group D.—The urines in this group were free of all signs of complicating disease. They were sterile on culture and remained sterile for weeks on incubation. Three urines which had remained sterile on incubation were tested for their toxic effect. The urine was injected subcutaneously into a guinea-pig which was killed after a week and the organs at once fixed in Zenker's fluid for microscopical study. Case 4107: This urine was obtained from a case of subacute or chronic nephritis and contained 3 parts per 1000 albumin. A guinea-pig injected with 3 c.cm. incubated urine was killed ten days later. The liver and kidneys were normal on careful microscopical scrutiny. Case 3079: This urine resembled serum in appearance; it had a sp. gr. 1036 and contained at least 31 parts per 1000 protein (globulin being present). The patient had more or less œdema for three years and gave a positive Wassermann reaction. A guinea-pig was injected with 3 c.cm. and killed ten days later. Its liver showed areas of focal necrosis with hæmorrhages; the kidney some cloudy swelling and a few hæmorrhages. Case 1814: The fresh urine from this case of acute nephritis (Group C) was doubly filtered through a Berkefeld candle and remained sterile on incubation. 2·5 c.cm. was injected into a guinea-pig and the animal killed seven days afterwards. Microscopical examination of the liver showed a normal appearance; the kidneys were also normal except for a very slight cloudy swelling in a few of the renal tubules.

Summary.—The toxic effect of nephritic urine was shown to depend chiefly on the presence or absence of bacteria. In view of the precautions taken in the collection of the specimens and the absence of the usual contaminating organisms such as cocci and yeasts, the frequency with which pure cultures of Gram-negative bacilli had been obtained was significant. Further, these results corroborated those obtained from the experiments with actual kidney tissue already detailed, and indicated that further study of the bacilli isolated was necessary.

The Characteristic Organism.

The bacteriological part of this investigation was kindly undertaken by Dr. J. K. Clarke, who reports as follows.

Note by Dr. J. K. CLARKE.

"The organisms are all short, plump, Gram-negative bacilli, and their cultural characteristics are those of the coli-typhoid group. Some are motile, some non-motile; some produce indol from peptone water, others do not; and they differ in power of fermenting carbohydrates. The following are the reactions which they give:—

Case No.	Motility.	Glucose.	Lactose.	Dulcite.	Saccharose.	Mannite.	Maltose.	Indol.
11082	0	AG	AG	AG	AG	AG	AG	+
11203	0	AG	AG	—	—	AG	AG	+
599	+	AG	AG	AG	AG	AG	AG	+
10741	+	AG	AG	AG	—	AG	AG	+
7286	+	AG	AG	AG	—	AG	AG	+
10821	+	AG	—	—	—	AG	AG	+
702	+	A	—	A	—	A	A	+
10300	+	AG	—	AG	—	AG	AG	0
2021	+	AG	—	AG	—	AG	AG	0
5170	+	AG	—	AG	—	AG	AG	0
1814	+	A	—	—	—	A	A	0
1946	+	AG	—	—	—	AG	AG	0

A, acid formation; G, gas production.

As will be seen, the first five are lactose fermenters, 10741 and 7286 giving the reactions of *B. coli communis* and the others being closely allied. 10300, 2021, and 5170 appear to belong to the paratyphoid-Gärtner sub-group. 1814 and 1946 grew very slowly, in contrast to the remainder, whose growth was vigorous, and 1946 fermented glucose, mannite, and maltose only feebly. Another organism (No. 2149) could not be grown in subculture.

Agglutinating sera for the most important of the organisms are being prepared, and when these are ready further experiments will be carried out with a view to a more definite classification."

Injection of Cultures into Animals.

The relation of these organisms to nephritis was tested in two ways: (1) by injection of pure living cultures into animals; (2) by the use of killed cultures as vaccines for treatment of cases of nephritis in man.

Injection of cultures.—In planning these experiments advantage was taken of the results of previous experiments to avoid sources of error. Thus, it had been found that incubated urine and cultures of the organisms in fluid media were often toxic enough to kill guinea-pigs on intraperitoneal injection in comparatively small doses. The animal succumbed to a general septicæmia, and it was quite possible that the nephritis induced was due rather to a profound toxæmia than to a selective action on the kidneys. Hence, quite small doses of an agar culture emulsified in saline were preferable; the injections should be subcutaneous where any local irritant effect could be observed.

Secondly, it was obvious that the urine of guinea-pigs was quite an untrustworthy indicator of any nephritis present. The urine of these animals is so highly alkaline that tests for albumin were generally negative, even when an advanced degree of renal disease was undoubtedly present. So it was resolved to use white rats for preference, since these animals excrete an acid urine normally free from albumin.

Lastly, the experimental animals were to be killed at definite intervals, cultures taken, and specimens for microscopical study preserved in Zenker's fluid to obtain the best results.

For these experiments pure cultures from uncomplicated cases of nephritis were selected (Cases No. 1814, 1946, 2021, and 11082).

No. 1814.—This bacillus was obtained in pure culture from the urine of a boy ill with acute nephritis. Two rats (A) and (C) were each injected with 1·5 c.cm. of a fairly strong emulsion made from a subculture; a third rat (B) was injected with 1 c.cm. of sedimented urine after incubation.

All three rats developed an albuminuria within three days, and this persisted until they were killed after varying periods. At first the rats appeared somewhat ill and excreted little urine; later they showed no obvious symptoms. The albumin, precipitated by boiling, occupied from 1/10 to 1/6 of the volume of urine. Some pus corpuscles were present, but casts could not be identified. There was no swelling at the sites of inoculation.

Rat (A) was killed one week after injection. Agar cultures of the heart blood, spleen, and kidney remained sterile. The spleen was greatly enlarged, measuring 1¾ in. in length. On section the kidney showed definite hyperæmia and marked granular degeneration of the epithelial cells of the convoluted tubules, the changes being of wide but unequal distribution. The spleen showed a general hyperplasia.

Rat (B), injected with incubated urine, was killed after an interval of two weeks. As before, agar cultures of the blood and kidney remained sterile; the spleen measured 1 in. in length. On section the kidney showed marked hyperæmia with actual hæmorrhages into some tubules and glomeruli. There was widespread degeneration of the tubular epithelium, and a few glomeruli showed proliferation of the cells lining Bowman's capsule. In places a small-celled infiltration was seen between the tubules.

Rat (C) was killed six weeks after injection of the culture; it had shown persistent albuminuria. Cultures were negative; the spleen measured 1½ inches in length. On section of the kidney there was definite degeneration of the renal epithelium, affecting chiefly the convoluted tubules, with areas of well-marked infiltration of cells, more numerous in the cortex.

No. 1946.—This culture was obtained from a patient who had had nephritis for some ten weeks. 1·5 c.cm. of a fairly thick emulsion was injected subcutaneously into a rat. The animal developed an albuminuria, slight at first, but quite definite after ten days. It was killed five weeks after inoculation, and at this time blood corpuscles and leucocytes were found in its urine. On section the kidney showed hyperæmia with hæmorrhages between the tubules and into some glomeruli. The renal epithelium was degenerated, especially in the convoluted tubules; there was some proliferation of the capsular epithelium in certain glomeruli, and in places a small-celled infiltration.

No. 2021.—This culture was obtained from a case of nephritis of two months' duration; the patient had suffered from malaria, and had a typical attack while in hospital. 2 c.cm. of a thin emulsion of the culture were injected subcutaneously into a rat. Here, again, there was no local reaction, and it was some ten days before albumin was unmistakably present in the urine. The albuminuria, however, persisted until the animal was killed, six weeks later. At autopsy the spleen measured 1¼ inches in length. The kidneys showed less epithelial degeneration than in the preceding animals, and there were no hæmorrhages, but a small-celled infiltration was evident in many parts of the cortex.

No. 11082.—This organism was obtained from the urine of a resolving case of acute nephritis. The urine contained some pus, but showed no evident bacteria. Cultures taken from a fresh catheter specimen were sterile, but after incubating the urine for 24 hours a positive result was obtained. 3 c.cm. of this incubated urine in an early experiment had been injected into the peritoneal cavity of a guinea-pig. The animal died in six hours, and from its heart's blood the original bacillus was recovered. Later, the culture obtained on passage was subcultured and a loopful emulsified and injected subcutaneously into another pig. This animal was killed after seven days and bouillon cultures taken of its blood, urine, and kidney. The cultures remained sterile. On section the kidney showed degeneration of the epithelium of the convoluted tubules, very marked in places, with tube casts in situ and occasional hæmorrhages. The liver showed profound degeneration—almost necrosis of many cells, especially at the centres of the lobules.

Two other guinea-pigs were injected with very small doses of a subculture of the original obtained from the patient's urine. One was killed a fortnight later and showed moderate degeneration of the cortical epithelium with a few hæmorrhages; cultures remained sterile. The second pig was killed after an interval of three weeks, and the results were similar. In this pig the liver was examined and showed very distinct degeneration of the cells.

Summary.—The results of these experiments with pure cultures of bacilli isolated from uncomplicated cases of nephritis may be summarised as follows:—

(*a*) General effects. Moderate doses did not produce a fatal septicæmia, but there was a well-marked swelling of the spleen which persisted for some time after the blood-stream was free of bacteria. This phenomenon, it may be remarked, is seen in cases of human typhoid, and a similar enlargement of the spleen has been reported in epidemic nephritis in civil life.

(*b*) Nephritis. The nephritis induced ran a distinct course which varied in intensity according to the virulence of the strain and amount of the culture injected. The chief changes were: An early hyperæmia with degeneration of the renal epithelium, most marked in the convoluted tubules. Later, more advanced degeneration with continued hyperæmia and hæmorrhages into the tubules and occasionally the glomeruli. Casts could be seen in situ. Lastly, some proliferation of the interstitial tissue. In no case did the nephritis show the characters of a septic infection. There were no intense glomerular changes nor leucocytic infiltrations.

(*c*) Liver changes. In the animals examined for such changes it was found that the bacilli had quite as marked an effect on the liver as on the kidneys. There was profound degeneration, amounting sometimes to actual necrosis, with hæmorrhages.

An interesting feature was the persistence of the renal lesions for weeks after no organisms could be detected on culture of the organ in animals killed at an earlier stage.

Experiments with Other Organisms.

In light of the knowledge gained of the effects of these bacilli obtained from cases of uncomplicated nephritis it was possible to apply the experimental test to other organisms isolated from cases where a secondary infection could not be excluded. This would also afford an opportunity to correlate the effects produced on the kidneys and the liver. For this purpose pure cultures of strains whose characters had been ascertained already were used. The same procedure was followed as in the first series, using the following organisms: (1) Intestinal types, Nos. 10741, 7286, 702, 11203, and 10821; (2) Gram-positive bacilli, Nos. 2136 and 3360.

In each series the animals were inoculated subcutaneously with approximately similar doses and killed at the end of a fortnight. In no case was there any noticeable reaction at the site of injection.

The patient was placed on the ordinary treatment and his abdomen tapped. During the first month he improved slightly, the amount of urine rising to a daily average of 1000 c.cm. His condition then remained stationary for the next two and a half months (vide Chart 1); the œdema persisted with the same urinary output and an albuminuria of 12 to 16 parts per 1000 (Esbach). Examination of the blood showed no retention of urea.

A vaccine was prepared with considerable difficulty. The large bacilli observed grew unchanged in incubated urine, but on agar lost their staining powers very rapidly. Injections of this vaccine reduced the amount of pus in the urine to a sensible extent, but had no effect on the nephritis beyond reducing the degree of albuminuria to about 12 parts per 1000. The general œdema and quantity of urine excreted were unchanged.

Trial was therefore made of a vaccine prepared from a culture obtained from a case of resolving nephritis in hospital. (No. 11082.) The effect of the first dose of 25 millions was slight, but a second injection of 50 millions was followed by a marked diuresis which persisted until his discharge five weeks later. In the first ten days of this diuresis he lost 21 lb. weight with a rapid disappearance of his ascites and œdema, while the albuminuria fell to the low level of 1·5 parts per 1000. This striking result was closely similar to that reported in a case of syphilitic nephritis under specific treatment about this time.[5] (No. 10774.)

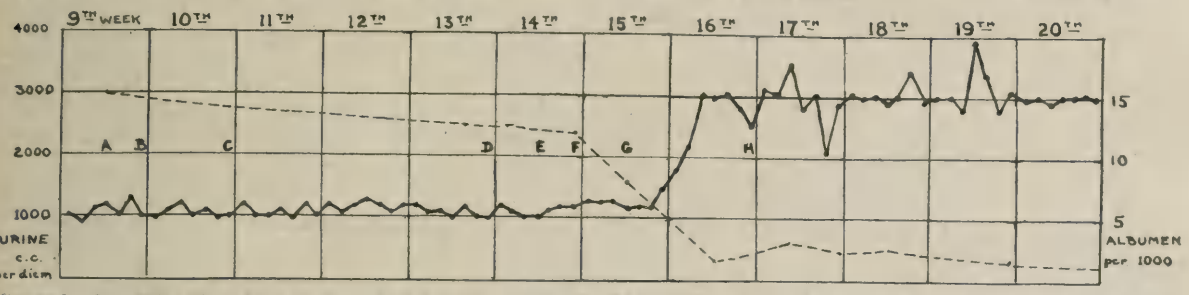

CHART 1.—Case 8934. Chart from ninth week of stay in hospital. The thick continuous line shows the daily excretion of urine; the thin interrupted line the amount of albuminuria. A, Autogenous vaccine No. 1, dose 40 millions; B, 60 millions; C, 100 millions. D, Autogenous vaccine No. 2, dose 20 millions; E, 30 millions. F, Vaccine from Case 11082, dose 25 millions; G, 50 millions; H, 75 millions.

(1) The Gram-negative series showed a very interesting gradation of effect on the kidneys and liver, ranging from the slightest disturbance to an extremely severe lesion.

Organism No. 10741 gave the typical cultural characteristics of *Bacillus coli communis*. The pig injected with an emulsion and killed a fortnight later showed a normal liver and practically a normal kidney. This result was confirmed by an experiment on a rat which was injected with rather a large dose of a *B. coli* culture obtained from a case of simple bacilluria. The animal died in two days and the kidneys showed some hæmorrhages, but the renal cells showed little signs of degeneration.

Organism No. 7286 had a slight but distinct effect. The liver exhibited degeneration of scattered cells and the kidney showed some hæmorrhages and degeneration of the epithelium in various tubules.

Organisms Nos. 702 and 11203 showed a more powerful toxic effect. There was a diffuse degeneration of the epithelium in most of the renal tubules, especially in the cortex, with occasional hæmorrhages. The livers showed degeneration of many cells, with badly-staining nuclei, while the liver of the pig injected with No. 702 was studded with numerous hæmorrhages.

Organism No. 10821 had a profoundly toxic effect. The liver showed absolute necrosis with loss of cell outline and nuclei. In the kidneys the epithelium of tubules both in the cortex and medulla were highly degenerated with casts in situ and hæmorrhages.

A rat injected with the same culture was killed 30 days later. The liver exhibited distinct degeneration, while the kidneys showed a good deal of tubular degeneration with hæmorrhages. During life there was albumin present in the rat's urine.

(2) The Gram-positive bacilli isolated from cases Nos. 2136 and 3360 had little similar effect. A rat injected with organism 3360 failed to develop albuminuria. A pig killed a fortnight after inoculation with organism No. 2136 showed very slight degeneration in some of the renal tubules, but some excess of connective tissue. The liver of this animal exhibited a very distinct degree of early fibrosis; the hepatic cells were healthy.

Remarks.—The experiments showed that organisms of strictly *B. coli* type had little effect, while other strains which appeared closely related might cause severe degeneration of the kidneys and liver. In all cases the effect on these two organs was closely comparable.

Trial of Vaccines.

The ætiological significance of the cultures obtained from incubated urine in cases of nephritis was tested by their use as vaccines for patients. The following case-histories and charts illustrate the effects produced:—

CASE 8934.—A male of 31 years was admitted in October, 1919, for general œdema and scanty urine of three weeks' duration; there was no history of preceding illness. Examination showed extensive œdema with ascites and a right hydrothorax. The urine averaged 400 c.cm. per diem; it had a sp. gr. 1028, was acid in reaction, and contained 15 parts per 1000 albumin. The sediment showed abundant casts, many pus cells, and large non-motile bacilli. Injection of this urine was quickly fatal to guinea-pigs.

It appears, therefore, that the bacilli so evident in this patient's urine represented an independent infection and had no causal relation to his nephritis. The success of a vaccine prepared from another case of nephritis indicated that there was another bacillus infecting the kidneys allied to this 11082 organism.

CASE 1814.—A boy of 6 years was admitted with ascites and marked dropsy, stated to have been present for ten days only. The heart was slightly dilated, there was some bronchitis and irregular fever. Both the liver and spleen showed a minor degree of chronic enlargement, probably due to Banti's disease, which is very common in Egypt. The boy showed no signs of congenital syphilis. The urine averaged 250 c.cm. per diem; sp. gr. 1020 with 2 parts per 1000 of albumin. Microscopically many casts—blood and cellular—were found with a few bilharzia ova.

On the seventh day after admission he was given a small dose of the 11082 vaccine (10 millions). This was at once followed by an increased output of urine (vide Chart 2), but the diuresis was not

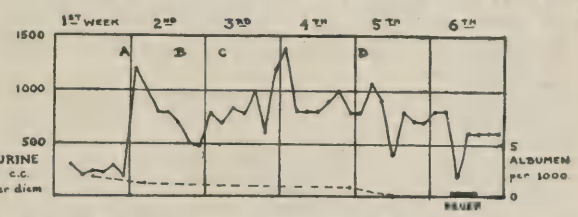

CHART 2.—Case 1814. A, Vaccine from Case 11082, dose 10 millions; B, 12 millions. C, Autogenous vaccine, dose 15 millions; D, 30 millions.

maintained and the œdema showed no sensible diminution in spite of a second dose. Meantime a vaccine had been prepared from a bacillus grown in pure culture from a catheter specimen of his urine of a different type to the 11082 organism. Injection of this autogenous vaccine led to a very rapid disappearance of the extensive œdema and ascites with a loss of 8 lb. in weight. Convalescence was interrupted by a bout of fever for a few days, but was extremely rapid, and he was discharged with urine perfectly free from albumin.

CASE 2021.—A man, aged 25, was admitted for general œdema, which had come on gradually after an attack of fever two months before. His subsequent history shows that this fever was probably malaria. On examination the patient was anæmic (hæmoglobin 50 per cent.); the spleen was palpable and ankylostoma ova were found in his stools. The urine averaged 1000 c.cm. daily, had a sp. gr. 1015, and contained 1 part per 1000 albumin. Microscopically there was an extraordinary number of casts, but no excess of pus corpuscles. He was given oil of chenopodium and received a dose of the 11082 vaccine (50 millions), but then developed intermittent fever. This was found to be malarial and yielded to quinine. Neither the vaccine nor thorough quinine therapy had any effect on the nephritis.

Meantime a culture had been secured from the catheter urine, before the onset of fever, and as soon as the temperature had

settled a small dose of autogenous vaccine (25 millions) was given, but without result (vide Chart 3). Nine days later a larger dose of 100 millions was injected and was immediately provocative of an unmistakable diuresis. Unfortunately, the patient had developed a troublesome diarrhœa, and insisted on his discharge rather than submit to a restricted diet.

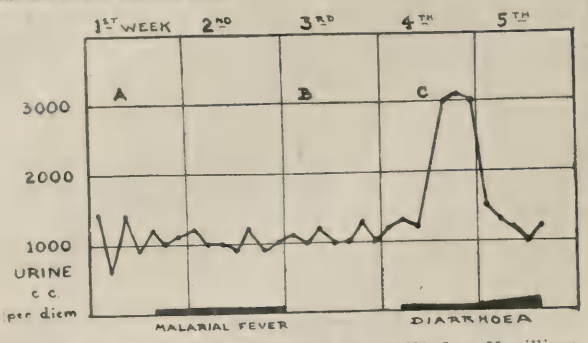

CHART 3.—Case 2021. A, Vaccine from Case 11082, dose 50 millions. B, Autogenous vaccine, dose 25 millions; C, 100 millions.

Of course one case proves nothing, but the course of the nephritis in this patient shows that it can hardly have been malarial in origin, and I confess to being somewhat sceptical of the large rôle assigned to this fever in the ætiology of nephritis in warm countries.

CASE 4397.—A man, aged 24, was admitted for general œdema and breathlessness of gradual onset for the past four months. The swelling had first appeared in the eyelids, then in the scrotum and abdomen, and last in the limbs. On admission there was ascites and the heart was dilated and irregular without murmurs; the blood pressure was unusually low (systolic 97 mm.; diastolic 74). The urine was of high sp. gr. and contained a fair trace of albumin; the daily amount excreted is shown in Chart 4. Microscopically, numerous granular casts were found; cultures were sterile.

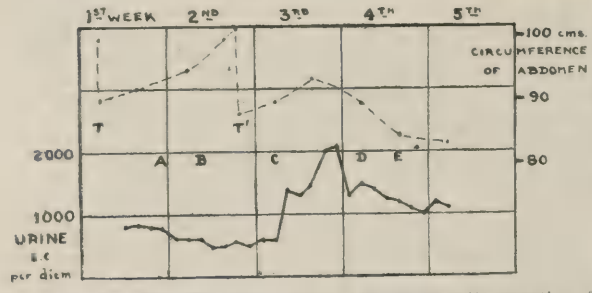

CHART 4.—Case 4397. The continuous line shows the daily excretion of urine; the interrupted line shows the variations in the ascites recorded by measurement of the abdominal circumference. T, Abdomen tapped (8000 c.cm.); T', Second tapping (8500 c.cm.). A, Vaccine from Case 11082, dose 50 millions; B, 100 millions. C, Vaccine from Case 1814, dose 50 millions; D, 80 millions; E, 120 millions.

The patient failed to improve after admission to the wards. His abdomen was tapped and 8 litres withdrawn, but the fluid at once began to reaccumulate, in spite of treatment with digitalin and saline purgatives. Two doses of the 11082 vaccine were administered, but the output of urine fell rather than increased, and the ascites had to be tapped again. Since the temperature had been slightly irregular the possibility of septic endocarditis was considered, but a leucocyte count was normal (8150).

Finally, trial was made of the 1814 vaccine, and the patient immediately responded. In spite of the heat of an Egyptian summer there was a decided diuresis, and the tide of accumulating ascitic fluid was turned. As in the other cases there was no rise of blood pressure, but the heart became regular and smaller in size. The granular casts practically disappeared from the urine, and the patient made a rapid recovery from his very serious condition.

The special interest in this case lies in the effect of one particular vaccine on a case of chronic nephritis with dilated heart, when the urine was sterile. A similar result was obtained in another patient with marked oliguria and dropsy, but without any sign of heart failure and only occasional albuminuria.

Control cases.—To check these results trial was made of these vaccines for cases of chronic cardiac disease and of hepatic cirrhosis with ascites, but in no instance was any diuretic or other effect observed. A vaccine prepared from a Gram-positive bacillus (Case 3360) had no effect on the nephritis of this patient.

Remarks.—The above examples show that the effect of vaccines is specific, and is only obtained when a suitable strain of organism is used. The reaction is usually immediate, but may occur after two or three days' interval. Naturally a great deal more work requires to be done before the best methods of using vaccines can be evolved. But it can be stated that the use of autogenous vaccines is generally indicated since the strains of bacilli isolated show decided differences. Such vaccines, however, may fail in cases complicated by some other infection of the urinary tract, for they may contain few organisms derived from the kidneys. Dr. Clarke has tried plating such cultures on McConkey's medium so as to isolate bacilli of intestinal type. For early use in such cases, and for patients in whom the acute stage is passed and the urine may remain sterile on incubation, stock vaccines are of value. It is proposed to try large doses of detoxicated vaccine made by pooling vaccines prepared from the various strains already isolated and others doubtless to be found in the future.

Discussion of Results.

These investigations indicate that many cases of "idiopathic" nephritis—acute, subacute, or chronic—may be due to infection by bacilli of intestinal types. In its mode of origin the affection would therefore be akin to colon bacilluria, but the particular germs responsible attack the renal epithelium and not the urinary tract. The type of lesion reproduced experimentally is essentially a tubular nephritis. The severe forms of glomerulo-nephritis seen in some specific fevers and septic infections appear often due to pyogenic bacteria (especially streptococci) or other organisms responsible for a septicæmia. But while the bacillary form described in this paper never appears to present the features of a septic nephritis, it can cause hæmorrhage from the kidney.

It is well known that a nephritis once established has a strong tendency to become chronic. The nephritis induced by injection of the bacilli isolated exhibited a similar tendency, although it was rarely possible to recover the germs from the animals infected when the early stage was past. This fact may explain why the urine from cases of chronic parenchymatous nephritis in man is so often sterile. In such cases the acute stage of the infection has passed leaving the kidney severely damaged, its powers of recovery possibly jeopardised by injudicious feeding before the nature of the disease was apparent. The work of Allen on experimental diabetes has shown that, in a dog whose pancreas has been reduced to a minimum, a fatal progressive diabetes may be induced or avoided according to the diet given. Recovery from acute nephritis is probably largely influenced by a suitable diet. On the other hand, in chronic cases a vicious circle may follow the excessive loss of serum albumin in the urine. Hence we should always expect to find germs in the urine of acute nephritis (apart from cases of poisoning), but not necessarily in the chronic stages.

Following the work of Opie and Oertel on the changes produced in the liver as well as in the kidney by the chemical excitants of nephritis, in my later experiments I found the same to hold true of bacillary nephritis. Although this result may seem at variance with our ideas of nephritis it is not opposed to clinical experience. For in the two diseases of man which are invariably associated with nephritis—i.e., eclampsia and infectious jaundice (spirochætosis ictero-hæmorrhagica)—the changes in the liver are notoriously as important as those in the kidneys. And it is an aphorism that in febrile cases with jaundice the urine is albuminous, an observation which illustrates the close relation between these organs both in function and liability to disease.

On this point, as indeed on the others raised, much work remains to be done. But the probability of hepatic lesions being coincident with the renal changes in parenchymatous nephritis should be taken in account in investigating the metabolic disturbances that occur in the disease. It is possible, for instance, that a non-retention of urea may partly depend on a defective formation of this substance by a diseased liver.

Summary.

(*a*) From the urine of patients with "idiopathic" nephritis and from the kidney of a case of fatal nephritis,

bacilli of intestinal types have been isolated in pure culture.

(*b*) Injection of these cultures and subcultures into animals provokes an acute nephritis.

(*c*) From the kidneys of these animals in the earlier stages of nephritis the bacilli injected have been recovered in pure culture.

(*d*) Injections of cultures obtained from animals infected with these bacilli have reproduced the disease in other animals.

(*e*) The nephritis induced runs a somewhat prolonged course, and is accompanied by acute degeneration of liver cells and an enlargement of the spleen in the early stage.

(*f*) In human cases of nephritis treatment with appropriate vaccines has caused rapid amelioration.

(*g*) In some cases of nephritis a secondary or an independent infection of the urinary system may be present and obscure the original cause. This complication is probably more common in Egypt than elsewhere owing to the prevalence of bilharziasis.

In conclusion, it is my pleasant duty to record the valued help of my friend Dr. Clarke, who is responsible for the bacteriological classification and has done much to help the research. My thanks are similarly due to Dr. Yussef Barrada, who secured so many cases of nephritis for my section, and to my house physicians for their care of the patients, collection of urine, and injection of vaccine.

References.—1. Scheidemandel: Münch. med. Woch., 1913, Nos. 60 and 61. 2. Hort: Brit. Med. Jour., October, 1914, p. 713. 3. Opie: Jour. Exper. Med., 1912, vol. xvi. 4. Oertel: THE LANCET, May, 1914, p. 1450. 5. Day: THE LANCET, May, 1920, p. 1009.

THE USELESSNESS OF ANTIMONY IN THE TREATMENT OF FILARIASIS.

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Sir Leonard Rogers[1] has recently reported some observations upon antimony injections given intravenously for the treatment of filariasis, and has pointed out that very careful and prolonged counts are necessary before coming to a conclusion as to the efficacy of this treatment. His results, on the whole, appear to indicate that these injections have a definite effect in greatly reducing the filarial embryos or causing them to disappear from the peripheral blood, presumedly as a result of the destruction of the adult worms.

Recital of a Case.

One of us (G. C. L.) has recently pointed out that for all filarial work, such as estimating embryos, it is essential that measured quantities of blood should be taken, and that before any treatment is commenced the number of embryos occurring regularly in the blood should be known accurately. Variations are not uncommon, and may give rise to false impressions. The drug may act either by killing the embryos or by killing the adults or by killing both. Having had the opportunity of studying a case of filariasis (*F. bancrofti* infection), with plenty of embryos present in the night blood, we gave the patient a series of tartar emetic injections intravenously, and controlled these by nightly examinations of the blood, both before, during, and after the injections, the same measured quantity of blood (20 c.mm.) being taken at the same hour nightly. Dried films were made, the hæmoglobin then being washed out and the film stained with fuchsin. For the determination of death of the embryos wet cover-glass preparations were also employed.

[1] THE LANCET, 1919, ii., 604; Brit. Med. Jour., May 1st, 1920.

History of the case.—Mr. V., a native of India, had lived there all his life till he came to England in July, 1919.

Previous illnesses.—No dysentery, no malaria, no venereal disease.

Present illness.—This began with an abscess on the inner side of the left thigh over the adductor tubercle ten years ago. *F. bancrofti* embryos were found in his night blood then. Six years ago he had another abscess, this time in the left groin; it was deep and was operated on and drained. In 1914 an abscess developed in the scrotum. After that the scrotum began to enlarge, the enlargement being of an intermittent nature and sometimes disappearing entirely. The attacks of enlargement were accompanied by pain, fever, and general malaise. Finally, the condition passed into a permanent one and definite elephantiasis supervened. The patient saw Sir James Cantlie on coming to London in 1919. The latter operated upon him, removing the elephantoid scrotum with successful results. Since then the patient has been living in England and has suffered from no further febrile attacks.

Examination.—Teeth had all been taken out for pyorrhœa. Heart and lungs normal. Urine: No albumin, blood, or sugar.

Filarial condition.—Has had an elephantiasis of scrotum, successfully operated on. Penis also slightly affected. Deep scar in left groin, also another on inner side of left thigh. Glands enlarged just below Poupart's ligament on left side. Elsewhere no enlargement.

Blood.—A fair number of *Filaria bancrofti* embryos in night blood; definite nocturnal periodicity.

Injections and Filarial Counts.

Tartar emetic injections were given intravenously in the usual manner, commencing with ½ gr. and increasing by a ½ gr. each time till 2½ gr. was reached, a total of 17½ gr. in all being given. The patient bore these very well without ill-effects.

The following table gives the details of the filarial counts and the injections:—

(A) Number of filarial embryos in 20 c.mm. blood.
(B) Number of grains of A.T. injected.

Date. 1920.	Hour P.M.	(A)	(B)	Date. 1920.	Hour P.M.	(A)	(B)	Date. 1920.	Hour P.M.	(A)	(B)
June 21	11.55	15	—	July 10	11.55	15	—	July 27	—	20	—
,, 22	,,	17	—	,, 11	,,	18	—	,, 28	—	17	—
,, 23	,,	15	—	,, 12	4	—	1½	,, 29	4	—	2½
,, 24	3	0	—		11.55	6	—		11.55	22	—
	11.55	13	—	,, 13	,,	18	—	,, 30	,,	20	—
,, 25	,,	16	—	,, 14	,,	16	—	,, 31	,,	18	—
,, 26	,,	14	—	,, 15	4	—	2	Aug. 1	,,	20	—
,, 27	,,	10	—		11.55	9	—	,, 2	4	—	2½
,, 28	3	0	—	,, 16	,,	18	—		11.55	23	—
	11.55	21	—	,, 17	,,	22	—	,, 3	,,	19	—
,, 29	,,	16	—	,, 18	,,	28	—	,, 4	,,	17	—
,, 30	,,	12	—	,, 19	4	—	2½	,, *5	,,	7	—
July 1	,,	14	—		11.55	10	—	,, 6	,,	10	—
,, 2	,,	20	—	,, 20	,,	22	—	,, 7	,,	14	—
,, 3	,,	15	—	,, 21	,,	24	—	,, 8	,,	19	—
,, 4	,,	25	—	,, 22	4	—	2½	,, 9	,,	16	—
,, 5	4	—	½		11.55	10	—	,, 10	,,	10	—
	11.55	15	—	,, 23	,,	18	—	,, 11	,,	17	—
,, 6	—	15	—	,, 24	,,	20	—	,, 12	,,	10	—
,, 7	—	32	—	,, 25	,,	25	—	,, 13	,,	14	—
,, 8	4	—	1	,, 26	4	—	2½	,, 14	,,	15	—
	11.55	4	—		11.55	15	—	,, 15	,,	22	—
,, 9	,,	12	—								

* It was decided at this date to stop the injections as they were doing no good.

Discussion of Results.

A perusal of the above table shows that the injections, consisting of a total of 17½ gr. of tartar emetic, had no effect upon the infection at all, the adult worms not being killed and going on pouring embryos into the blood as before. The embryos were not all killed either as, even though reduced in numbers as on the night after the injections, those present were alive and healthy.

The only feature worthy of note is, that at first there were fewer embryos in the sample of blood taken on the night of the injections which were given at 4 P.M. This is not surprising when one considers that they would be in the lungs at that time and that the antimony would come in direct contact with them in a concentrated solution. That there was no effect upon the adults is shown by the numbers being up to normal the next evening and afterwards. Further, towards the end of the injections, even although the large dose of 2½ gr. was being given, this temporary disappearance was no longer noticeable, the number found on the same evening as the injections being up to the average, or even a little above. The table illustrates also the considerable constancy, in this individual case, of the number of embryos in the blood every evening. If the female worms constantly pour young into the blood, then there must be a corresponding destruction going on, to keep the numbers at this mean rate. Possibly on the days when over 20

embryos per slide were found there may have been an increased out-pouring from the female; or, of course, there may have been several females present giving birth to embryos intermittently.

It would appear, therefore, that antimony is not to prove a specific for filariasis as it is for bilharzial infections, but the only way finally to decide this point is to follow up cases, as has been done above, all results being checked by careful enumerations of the embryos. We have to thank Sir James Cantlie for letting us test the efficacy of the injections in this case.

NOTES ON THE

TREATMENT OF RECURRENT MALARIA BY NOVARSENOBENZOL.

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SO much has already been written as to the nature of malaria, the clinical and other characters of the disease, and the lines of treatment found to be most successful, that I propose here only to touch on a series of cases of recurrent malaria treated by me at the 3rd London General Hospital, Wandsworth, by intramuscular injections of novarsenobenzol (neokharsivan). Having seen during the last three years at least 500 cases of recurrent malaria from all parts of the world, I was struck by the fact that in all these cases the usual varieties of routine quinine treatment (i.e., by the mouth, intramuscular and intravenous) had been tried, in many cases pushed so far as to produce temporary blindness and deafness, and yet upon arrival in England the patients were still suffering from the disease, as shown by blood smears and a differential count. I therefore decided to venture on another line of treatment.

Rationale of Treatment.

My reasons for using novarsenobenzol were: 1. Because it has been conclusively proved that the malarial fevers are protozoal infections, infecting the red corpuscles of mammals, reptiles, and birds. 2. Because the organic compounds of arsenic in its trivalent form are more potent in action upon protozoa. 3. Because it is known to destroy the *Spirochæta pallida*, the balance of opinion now being distinctly in favour of the *Spirochæta pallida* being a protozoon.[1]

The reason why the spirochætes vanish so quickly after salvarsan, or neokharsivan, is that they contain free OH groups, since in their colloidal lipoid membrane an unsaturated fatty acid exists. It is to these OH groups that the metals become attached, with the result that the organisms perish. I therefore hoped the same result might take place with the malarial parasite.

The preparation used was novarsenobenzol (B. W. and Co.), which is easily soluble in water, yielding a neutral solution suitable for intramuscular or intravenous injection. The first two injections consisted of 0·3 g. in 5 c.cm. 0·5 per cent. sterile saline, and the last two injections of 0·4 g. in 7 c.cm. 0·5 per cent. sterile saline. These injections are given at intervals of one week. A line is drawn backwards from the anterior superior iliac spine to the top of the natal fold; this line is divided into three equal parts; the point of intersection of the upper and middle third is the site of injection. All the usual antiseptic precautions should be taken with regard to the sterilisation of needles and syringe. The night before treatment the patient is given a laxative, the following morning, three hours before the injection, he is given a light breakfast, and the food on that day should be light so as to throw as little strain as possible on the digestive organs during the elimination of arsenic. The patient should stay in bed for at least three hours after the injection, and in order to prevent any after-pains or reactive painful infiltration hydropathic measures such as moist compresses, hip-baths, or the application of a hot-water bottle may be employed.

If the pain is very severe I give the following powder, which I find efficacious: Pyramidon, 10 gr.; medinal, 3 gr.; heroin hydrochlor., 1/12 gr. In between the injections he is kept on mist. malaria (contains 2½ gr. quin.).

[1] Muir and Ritchie: Manual of Bacteriology, edition 1919, p. 506.

In all cases an examination of the blood is made before each injection with regard to the presence of the malarial parasite, and a differential blood count to ascertain especially any increase of the large mononuclears. This is a very important feature, as in cases where the parasite cannot be demonstrated in the blood the mononuclear reaction, along with the presence of pigment in the mononuclear cells (due to phagocytosis of pigment formed by the parasites), has been taken as evidence that the case is one of malaria. The mononuclear reaction is especially interesting from the fact that in other protozoal diseases an activity of the same elements has been observed.

Notes on Cases.

The following cases were all treated by intramuscular injections.

CASE 1.—Capt. E., R.A.M.C.(T.), the first patient of the series, was suffering from malignant malaria, contracted in Palestine, which produced pyrexial relapses every fortnight in spite of 14 intramuscular injections of quinine, and 45 gr. or more by the mouth daily for a month, followed by 30 gr. for three months. The cachexia, anæmia, and myocarditis served to emphasise the inadequacy of quinine. The effect of neokharsivan injections was to extend the fortnightly periodicity of relapses to an interval of two months in the first series, and to six months for the second series of injections.

Treatment started on May 19th, 1919. Patient left hospital on Sept. 19th, 1919; reported no lapse in December, 1919, and up to date (July, 1920) reports no recurrence. This patient had four intramuscular injections and one intravenous. He was hypersensitive to arsenic and developed a rash and acute asthmatic symptoms.

CASE 2.—Lieut. B., age 36. Type, M.T. Previous attacks 21. Five injections from July 24th to August 26th, 1919. Left hospital well. Reported Oct. 29th, 1919. No relapse.

CASE 3.—Lieut. P. Type B.T. Four injections. No malaria parasites present upon discharge. An acute attack of exfoliative dermatitis after last injection.

CASE 4.—Lieut. E. Type B.T. Sept. 18th, 1919, four injections. Left hospital Dec. 19th quite well.

CASE 5.—Capt. S. Type B.T. Four injections Sept. 18th, 1919. Left hospital Dec. 19th, 1919, quite well. Reported Feb. 7th, 1920. No relapse.

CASE 6.—Lieut. L. Type B.T. Five injections. Discharged quite well Oct. 5th, 1919.

CASE 7.—Lieut. A. Type M.T. Ten previous attacks occurring every two weeks. Four injections. Discharged quite well, December 1919. First injection Oct. 14th, 1919. Reported hospital Feb. 20th 1920. Very well. No relapse.

CASE 8.—Capt. M., R.A.M.C. Type M.T. Four injections. Discharged quite well Oct. 8th, 1919.

CASE 9.—Lieut. B. Oct. 31st. Type M.T., contracted in Macedonia. Fifty-four attacks. Spleen enlarged, tender. Four injections. Left quite free Dec. 20th, 1919.

CASE 10.—Lieut. B. Type B.T. First injection, Nov. 11th, 1919; fourth injection, Dec. 3rd, 1919. Left hospital free. Reported hospital March 25th, 1920. No attacks for over four months.

CASE 11.—Lieut. D., R.A.F. Type B.T. Four injections. Left hospital Feb. 25th, 1920, quite well. Seen in June, 1920. No recurrence.

CASE 12.—Lieut. W., R.A.F. Type B.T. First attack in Persia, 1916; since 14. Completed course, four injections. Discharged quite well Jan. 19th, 1920.

CASE 13.—Lieut. J., 31st Punjabis. Type B.T. First attack India, 1916; since ten. Four injections December, 1919. Pathological laboratory report: No parasites present.

CASE 14.—Lieut. F., R.F.A. Type B.T. First attack Batoum, 1919; since 3. November, 1919, four injections. Discharged free Jan 26th, 1920.

CASE 15.—Capt. P., 2nd Glosters. Type M.T. First attack, 1917; since 12. Four injections. Discharged free Feb. 18th, 1920.

CASE 16.—Lieut. B., R.F.A. Type B.T. First attack Baku, 1919, Four injections. Discharged free.

CASE 17.—Lieut. F., R.A.F. Type B.T. First attack India, 1919; since 4. December, 1919, four injections. Reported hospital Feb. 7th, 1920. Quite free.

CASE 18.—Lieut. W., aged 24. Type M.T. Dec. 17th, 1919. M.T. parasites present. No history of malaria. Symptoms very pronounced—malaria, cachexia, anæmia, jaundice, vomiting. Urine bile-stained. Fæces normal in colour. Constipated. Dec. 17th temp. 104° F. First injection 0·3 g. N.K. Dec. 18th temp. normal. Patient feels better; jaundice commenced to disappear; and patient made uninterrupted progress. Discharged Jan. 28th, 1920, free and well. March 30th, 1920, reported at hospital; no recurrence. Feels quite well; weighs 13 stone.

CASE 19.—Major D., aged 35. First attack September, 1919. Type M.T. This was the most difficult case of all to deal with. Had nine intramuscular injections, one intravenous. Left hospital on May, 1920. Pathological laboratory report: No M.T. present.

CASE 20.—Capt. P. Type B.T. Jan. 3rd, 1920, first injection completed. Course of four. Feb. 21st, 1920, reports no recurrence.

Conclusion.

It will be noticed that in the 20 cases here reported 12 were Type B.T. and 8 Type M.T., none of which have reported a recurrence. To the above-mentioned I can add another 18 cases, of which I have

notes, thus making 38 cases in all. I may say that only three patients have reported "they think they have had a slight attack" since leaving hospital.

Personally I am very gratified with the results and regret I did not keep more records. In cases where it is doubtful if the malarial parasite exists in the blood I have tried a provocative dose, and in several cases the desired result has been obtained. I would suggest that even two weeks after the blood gave a negative to M.T. or B.T. parasite, a mild provocatlve dose be given to ascertain whether a cure has been effected. If the disease is found to be latent a second course lasting another four weeks would be suggested.

In conclusion, I have to thank Major Essex Wynter, R.A.M.C. (T.), for permission to publish these notes; Captain W. L. Harrison, R.A.M.C. (T.), for his invaluable assistance in working out the pathological reports, especially as to the differential counts *re* large mononuclears; and Charge-Sister Brookes for her attention to the details regarding the preparation and after-care of the patients, the taking of temperatures, and valuable assistance given me in administering the injections.

A CASE OF

ACUTE ENCEPHALITIS LETHARGICA

FOLLOWED BY MYOCLONIC MOVEMENTS.

BY A. CECIL ALPORT, M.D. EDIN., M.R.C.P. LOND.,
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THE following case has certain points in common with the three cases of the myoclonic form of acute epidemic encephalitis described by Dr. Arthur W. M. Ellis in THE LANCET of July 17th. The muscular spasms, however, in my case were a late sequela of the lethargic state, and instead of the shock-like contractions of the abdominal muscles with delirium and insomnia noted by Dr. Ellis, there was general muscular rigidity associated with drowsiness and coma; delirium and insomnia were minor features. The history of the case was obtained after the patient had recovered.

History of the Case.

Pte. J. went to Salonika in November, 1915. First attack of malaria in the summer of 1916; numerous relapses during 1916, 1917, and 1918. Since returning to England has had slight shivers and headache; last relapse in October, 1919.

Admitted to the Royal Herbert Hospital on Nov. 12th, 1919. Somewhat confused in mind; states he has had malaria. Lies with eyes shut, showing no interest in his surroundings, but answers when spoken to. Temperature 100° F.; pulse 84, good volume. Blood examination: No malaria parasites found.

Nov. 13th, 1919: Patient is dull and lethargic; has incontinence of urine and fæces. T. 99·4°. P. 94. R. 36.

14th: Delirious and violent during the night; tried to get out of bed; very little sleep; quiet this morning; holds himself very stiff in bed, muscles of back being specially rigid; no vomiting; a few râles at base of right lung. It is impossible to palpate the spleen on account of the abdominal rigidity. T. 100°. P. 102. R. 36.

15th: No improvement. T. 99·4°. P. 86. R. 36.

16th: Still very stuporose; incontinent. 12 noon: Gave rectal saline 8 oz., with quinine sulph. 20 gr. 5 P.M.: Nearly comatose; very rigid; conjunctival reflex extremely sluggish. Gave intravenous injection of quinine bihyd. 40 gr. in 8 oz. of normal saline at a temperature of 110° F.

17th: Patient has greatly improved; speaks intelligently. T. 101·4°. P. 100. R. 36. Lumbar puncture attempted; no fluid withdrawn, patient too rigid for puncture without anæsthetic, and too ill to be anæsthetised to requisite depth. Blood culture negative after five days' incubation. Blood count: Total leucocytes, 9320 per c.mm. Differential count, neutrophil polymorphs, 83 per cent.; small lymphocytes, 7 per cent.; large lymphocytes, 5·5 per cent.; large hyalines, 2·5 per cent.; transitionals, 1·5 per cent.; basophils, 0·5 per cent.; eosinophils, 0 per cent. Urine: No albumin or sugar. Treatment: Rectal quinine 20 gr. night and morning, to be continued daily.

18th: More drowsy this morning. T. 100°. P. 106. R. 38. Case diagnosed as acute lethargic encephalitis by Dr. Newton Pitt, consulting neurologist to the hospital.

19th: Slightly improved. For the first time asked for and used the urinal instead of passing his water into the bed; no incontinence of fæces now. T. 101·2°. P. 120. R. 40.

20th: Continued improvement; less lethargic, although he is still very rigid. T. 100·2°. P. 114. R. 38.

21st: Patient is very much worse this morning; nearly comatose, can only just manage to put out his tongue, which is dry and covered with thick brown fur; muscles of back, abdomen, and limbs very rigid; has incontinence of urine and fæces. Rectal quinine saline not retained. T. 99·2°. P. 112. R. 88. Although we had decided that the patient was not suffering from cerebral malaria, his condition was such that I resolved to repeat the intravenous injection of quinine. I was guided in this by the quite remarkable improvement which had apparently resulted from the intravenous injection on the 16/11/19. Therefore, at 3 P.M., I gave him an intravenous injection of quinine, 40 gr. in 8 oz. of saline, as well as an intramuscular of 20 gr. I also ordered a rectal saline with quinine 20 gr. to be given at 11 P.M. At 10 P.M. the temperature had dropped to 97° F., P. 108, R. 40, and the patient appeared to be slightly better. 11 P.M.: Rectal quinine saline given but not retained.

22nd: Considerable improvement; much less rigidity of muscles; less drowsy; is more intelligent and understands what is said to him; on request made an attempt to whistle; no facial paralysis, ptosis, strabismus, or nystagmus, but states he sees double. T. 98·4°. P. 96. R. 38. 11 A.M.: Intravenous quinine, 40 gr. in ½ oz. of saline. Intramuscular quinine, 20 gr. Tongue is still very dry and furred. 6 P.M.: Can move legs and arms freely; reflexes are normal, but still has rigidity of abdominal muscles and incontinence of urine and fæces. 11 P.M.: Retained rectal injection of quinine 20 gr.

23rd: Improvement maintained; can put out tongue without difficulty; organ dry and furred; is quite intelligent; got out of bed this morning, took some grapes from his locker and ate them; read his letters. Abdominal muscles remain rigid, but general rigidity has passed off; still has incontinence and diplopia. T. 98·6°. P. 80. R. 36. Treatment: Intramuscular quinine, 20 gr., into each buttock. 6 P.M.: Rectal quinine, 20 gr.—retained. 11 P.M.: Rectal quinine, 20 gr.—not retained.

24th: Only slightly drowsy; speaks intelligently but slurs his words; sits up in bed when asked to; tongue furred but moist. T. 99°. P. 100. R. 36. 11 A.M.: Intravenous quinine, 30 gr. Intramuscular quinine, 20 gr. 6 P.M.: Rectal quinine, 20 gr.—retained. 11 P.M.: Rectal quininine, 20 gr.—not retained.

25th: Patient is making rapid strides towards convalescence. T. 99°. P. 86. R. 28. Says he is hungry and asks for food; sits up in bed smoking cigarettes; mentally clear; no sign of drowsiness; tongue quite moist and only furred on the posterior half. During the night, for the first time, he had no incontinence of urine. Throughout his illness he has been very constipated, and when he did pass a motion it was into the bed. On one or two occasions during his more lucid intervals he asked for the bedpan, but was unable to use it in time; has no incontinence of fæces now. Rectal quinine saline given t.d.s. and retained.

26th: Continued improvement. Second leucocyte count: Total whites, 20,400 per c.mm. Differential count: Neutrophil polymorphs, 68 per cent.; small lymphocytes, 16 per cent.; large lymphocytes, 13 per cent.; hyalines, 3 per cent. Quinine treatment stopped.

27th: Patient is better, but he has developed peculiar rhythmical movements of the right arm and leg; the finger movements have a strong resemblance to the athetosis of paralysis agitans; the arm and leg movements are choreiform in character.

Dec. 5th: During the past 10 days the patient's condition has greatly improved; speech is more distinct, and diplopia is no longer complained of. He has had slight irregular rises of temperature—99°. P. 98. R. 26. The arm and leg movements are worse, if anything, and he has sudden jerky spasms, due to contraction of the flexors of the limbs. He is able to feed himself, but very often an involuntary spasm of the muscles of the arm jerks the food he is carrying to his mouth over his shoulder or on to the floor. The mental state has improved, but he is depressed, very irritable at times, and difficult to nurse.

23rd: His general condition shows steady improvement; the temperature has been normal for a fortnight; there has been no return of the lethargic condition, but the rhythmical movements with sudden spasms are as bad as ever. There has been no diplopia or other sign of paresis of the ocular muscles since; his speech is more distinct and less slurring in character, but he is still depressed, irritable, and sleeps badly. He insulted the sister in charge of the ward this morning, and his behaviour at meals, on account of the unfortunate manner he has of jerking his food all over the table, has made him very unpopular with the other patients. Transferred to observation ward for mental cases. The report on blood taken for a Wassermann test is negative. Treatment: Pot. brom. 20 gr. t.d.s. and massage.

July 27th, 1920: Patient left this hospital six months ago, but I was fortunate enough to see him again to-day. He has almost recovered, and is able to go about London by himself. His mental condition is quite normal. His articulation is not absolutely clear yet, and he still has an occasional twitch of the right arm. He states that the twitching gets worse when he becomes over-tired. He sleeps, eats, and looks well.

I took the opportunity to have his eyes examined by the hospital ophthalmologist, who reports as follows: "Pupils react normally to light and accommodation; tension normal; convergence perfect; no abnormality of ocular muscles; says he has had diplopia, but not now. I am unable to find anything abnormal in the eyes."

Remarks.

Unfortunately I have no notes of the actual onset of disease except that the patient was taken ill at the Crystal Palace and that he had had malaria; there was no history of vomiting obtainable. The fever was of a mild type, but the pulse and respirations were rapid and continued so for months. No record was made of the condition of the pupils, although diplopia was noted. The speech was indistinct and slurring, and is still, after eight months, not quite clear. There was obstinate constipation and, after purgatives, incontinence of fæces. He had incontinence of urine for the first fortnight after admission; the urine showed no abnormality. The leucocyte counts are interesting. On Nov. 17th, 1919, there was a relative increase of neutrophil polymorphs, and the total count was more or less normal. Nine days later, when the patient was well on the road to recovery, the total number of leucocytes had risen to 20,400 per c.mm., the polymorphs had

fallen to normal, while the large lymphocytes had increased from 5·5 per cent. to 13 per cent. The latter rather points to malaria as a factor in the case. It was unfortunate that because of the rigidity of the muscles of the back and the fact that he took the anæsthetic so badly we were unable to obtain a specimen of his spinal fluid for examination; the Wassermann test on the blood was negative. The patient was delirious and violent on the third night after admission. His principal symptom was drowsiness; this deepened into coma on the fourth day, and after an interval of consciousness he again became comatose on the ninth day. Another marked feature was the rigidity, especially of the muscles of the back and of the abdominal wall. It is interesting to note that the abdomen remained rigid for some days after the general stiffness had disappeared.

As regards treatment, although parasites had not been found in his blood the treatment was carried out in accordance with the rule that all persons who have resided in a malarial district and suddenly become comatose should be treated with large doses of quinine by the intravenous and intramuscular or rectal routes.[1]

The end in this case appears to have justified the means, and was characterised by a rapid return to consciousness after the initial coma on Nov. 16th, 1919, and again after the relapse on the 21st. I do not, of course, suggest that the recovery of this patient was due to the treatment he received, but the speedy manner in which he seemed to react to the intravenous injection of quinine gives food for thought.

The case may have been one of cerebral malaria—the history and second differential leucocyte count are in favour of this. On the other hand, it may have been some form of encephalitis—the rigidity of the muscles in the acute stage, the lethargy, the mental condition, the diplopia, the myoclonic movements in the later stages, and the first leucocyte count would appear to justify this diagnosis.

Clinically, apart from the result of the treatment, the case certainly did not conform to the type of cerebral malaria we saw in Macedonia.

Of the sequelæ the mental condition, the rhythmical movements, the sudden muscular spasms, the pill-rolling movements of the fingers and thumb, the absence of paralysis, the report on the condition of the eyes by the hospital ophthalmologist, and the slow but steady recovery of the patient should be noted.

THREE CASES OF ARTHROPLASTY.

BY C. D'OYLY GRANGE, O.B.E., M.B., F.R.C.S.ENG.,
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THE following cases of arthroplasty following gunshot wounds of joints are described, as few similar cases seem to have been recorded, and they show that the limbs can be greatly improved by such operations.

1. *Gunshot wound of left buttock followed by dislocation of hip, with ankylosis.*—Pensioner J. T. was admitted to the Northumberland War Hospital in October, 1916, having been wounded more than a year previously. His chief wound was in the left buttock, the posterior lip of the acetabulum having been destroyed, and this had allowed of dislocation of the head of the femur on to the dorsum ilii. Here bony ankylosis had taken place with internal rotation of the thigh. The sciatic nerve had been partially injured. Drop-foot was present, and there were trophic sores on the toes. The right knee was ankylosed. When admitted there were several sequestra in the left ilium, and these were first removed. The wounds took a considerable time to heal, and the operation of arthroplasty had to be delayed owing to the fact that the trophic sores on the toes caused repeated attacks of inflammation in the skin and subcutaneous tissue of the leg and thigh. It would have been better if the foot had been amputated at this stage, as it had to be done later.

Operation.—On Oct. 6th, 1917, arthroplasty was performed, the neck of the femur being divided and a false joint made between the neck and head of the femur in the following manner. The patient lay slightly on his right side, with a sand-bag under the left buttock. A curved incision was made midway between the crest of the ilium and the great trochanter. The muscles were divided in the line of this incision until the neck and the head of the femur were laid bare. The head was firmly ankylosed on to the ilium. The tissues were freed from the neck, and it was then divided by a Gigli saw close to the head in an oblique direction, the line sloping from above downwards and inwards. The lower part of the head was now cut away with a chisel and the upper part hollowed out to form a cup, into which the neck fitted after the edges had been rounded off. A flap of gluteus medius was then sutured over the raw end of the neck and a loose flap of fat from the buttock was placed in the cup in the head of the femur. The neck fitted quite well into this cup, and when the gluteus medius and minimus had been sutured there was no tendency for it to become displaced. The wound was completely sutured and a Liston splint with weight extension was applied for two weeks. Healing was slightly delayed by the presence of a hæmatoma, which would have been avoided by the use of a small drain; but in spite of this the patient very quickly began to move his limb and to sit up in bed, and within two months he could flex his hip to a right angle. The condition of his foot did not improve, and accordingly a Syme's amputation was done in March, 1918. This, however, allowed of the fitting of an artificial limb, with the result that the left leg was equal to the right in length, and he began to walk. When seen in January, 1919, he could flex the left hip to a right angle, and stated that with his artificial leg he could walk seven miles. He considered the left leg better than the right, owing to the ankylosis of the knee on that side.

This operation is a little more difficult when the head of the femur is ankylosed in the acetabulum because the neck is deeper. Murphy's method of sawing off the great trochanter might be easier, but I have not tried it.

2. *Gunshot wound of right shoulder followed by ankylosis.*—The patient, Corpl. M. M., was wounded by shell in March, 1916, and was admitted to the Northumberland War Hospital in April. Several pieces of metal had entered his right shoulder from above, causing a large flesh wound, fracturing the clavicle and the acromion, and passing down into the head of the humerus and into the arm. In May several loose pieces of bone and some pieces of metal were removed from the head of the humerus, and the cavity was filled with B.I.P.P., but the wound did not heal. In August the B.I.P.P. and some sequestra were removed, and a long tract was found passing four inches down the humerus. Stereoskiagrams revealed a piece of metal embedded in the bone, and this was removed through an incision posteriorly. The wound then healed. The result was ankylosis of the shoulder-joint in a slightly abducted position, with a good deal of destruction of the head and great tuberosity; the fractures of acromion and clavicle united, and there was a good deal of scar tissue above the shoulder where the skin wounds had closed. The condition of the patient was not good, he was very anæmic and thin, so nothing surgical was done for some time. He found the arm of very little use to him, as with scapular movement he could only abduct it 30°. This movement was probably limited owing to the injury to the outer end of the clavicle, and consequent limitation of movement of the acromio-clavicular joint. Flexion of the arm was almost nil and there was no rotation.

Operation.—On April 14th, 1917, arthroplasty was performed. An incision was made along the lower border of the clavicle and down the front of the arm for three inches, another was made just below the acromion process to meet the first incision, and a third was made along the lower border of the pectoralis major; this last, with the clavicular part of the first, allowed the flaps of fascia to be taken off the pectoralis major. The pectoralis major was divided where it crosses the axilla, and the anterior half of the deltoid was also cut through half an inch below the acromion process and turned down. This exposed the short head of the biceps and coracobrachialis arising from the coracoid process; these were divided, as was also the pectoralis minor. The vessels and nerves were pushed downwards and inwards, the subscapularis was exposed and divided, and the head of the humerus thoroughly exposed. There had been a good deal of destruction of the head and a considerable amount of outgrowth of bone, with the result that the head of the humerus was very irregular in outline, and considerable difficulty was experienced in freeing the capsule and muscles on the posterior surface. When this was done a large joiner's chisel was used and the humerus was separated from the body of the scapula as near the joint line as possible, but a part of the axillary border of the scapula came away with the humerus, and it had to be excised. The head of the humerus was rounded off as much as possible and the glenoid smoothed down, and then a large flap of superficial fascia was turned in from the surface of the pectoralis major. The flap was hinged externally by two pedicles, which allowed of the muscles being sutured between them. The subscapularis muscle was then sutured, followed by the coracobrachialis, short head of the biceps and pectoralis minor, and, lastly, the deltoid and pectoralis major. The long tendon of the biceps must have been destroyed during the earlier months of suppuration, for it was not present over the upper part of the humerus. The wound was closed and the arm put up with the shoulder abducted 45°. There was considerable oozing during the whole operation and for several days after; the patient always bled freely. A small part of the pectoral flap, being very thin, sloughed, and a sinus remained over the head of the humerus. After repeated skiagrams and examinations with a probe, with negative results, the sinus was opened up and a sequestrum was removed. It was evidently one of the chips from the head of the humerus which had been overlooked, and after its removal the wound healed. The result of the operation, considering the amount of damage done by the wound, was good. Active abduction to 45° and flexion to 45° could easily be obtained quite painlessly, together with 60° of rotation. Passive flexion and abduction could be obtained to 90°.

3. *Gunshot wound of right elbow followed by ankylosis.*—Pte. F. D. was admitted in April, 1918, having received several wounds on the outer side of the arm and forearm about ten days previously, one of which opened up the elbow-joint. The wounds were dressed with B.I.P.P. and healed in eight weeks, but complete ankylosis of the elbow at an angle of 90° resulted, without, however, any loss of bone. The arm was treated with radiant heat and massage for two months, and then arthroplasty was done on Sept. 3rd.

Operation.—An incision 4 inches long was made on the outer and one on the inner side of the joint, and these were joined by a transverse incision across the arm above the olecranon. The ulnar nerve was dissected out and retracted inwards to avoid any

[1] Alport: Malaria and its Treatment, p. 56.

injury, the triceps muscle was divided transversely an inch above the olecranon, and the humerus exposed. The triceps was dissected down, both internal and external lateral ligaments were divided, and the olecranon and head of the radius exposed. A half-inch chisel was driven in, first on one side and then on the other, between the olecranon and radius on the one hand and the humerus on the other, keeping as close to the line of ankylosis as possible. The radius was easily separated by this means, but the ulnar was fixed by the ankylosis of the coronoid process and humerus; this was readily broken through by flexing the forearm. The surfaces of the bones were now very like the surfaces of the normal bones in shape, but very rough. They were smoothed down as much as possible, and made to fit and move easily the one on the other. The ankylosis between radius and ulnar was only fibrous and was cut through. A flap of fat from the posterior surface of the triceps was then turned into the joint and sutured to the anterior capsule, a piece of Cargile membrane being placed on each side of the flap. The triceps was sutured together and the skin closed, the arm being put up at right angles. Gentle movement was started in ten days' time, but it was painful. Massage was commenced at the end of three weeks.

The patient was discharged in January, 1919, his movements being flexion 30° beyond a right angle and extension 45° from a right angle. Pronation and supination were disappointing, as it only amounted to about 30°. Flexion and extension were very powerful movements, as he had full use of his biceps and triceps, and there was no lateral movement at the joint owing to the preservation of the original contour of the bones. The amount of movement obtained might have been improved by the excision of more bone, but I think the joint would have been less secure and the power of movement lessened.

Conclusions.

The operations have little risk, and the benefit in each case was considerable. The joints were very strong and there was no tendency to dislocation or to abnormal movement, as the chief ligaments remained.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF PURPURA FACTITIA.

BY KATHLEEN M. MCKEOWN, M.B., B.S. LOND.,
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THE following case is a typical instance of hysterical deception, confirmed by the confession of the patient.

A girl of 13 was admitted to hospital on April 22nd, 1920, for "purpura," when she gave the following history. On April 17th she had not felt well, had vomited once, and had complained of pains in both arms not limited to the joints. She stated that large purple patches, not painful on pressure, had appeared all over her arms and legs on the same evening, and that her elder sister had had similar patches all over her body some years before. No history of rheumatism was obtained. The patient belonged to people in extremely poor circumstances and was rather hysterical in type. Since March 3rd she had attended the hospital as an out-patient as she had fallen down a flight of stairs, and she was about to be discharged on April 17th.

Condition on admission.—Temperature, pulse, and respiration normal. On examination there were seven large "purpuric" patches, varying in size but not in shape, on the flexor surfaces of both arms and forearms, with three similar patches on legs. The highest patch on the right side was on a level with the tip of the acromion process. The patches on the legs were on the inner and outer surfaces midway between the knee and ankle. The patches consisted of numerous minute hæmorrhagic spots and petechiæ set closely together and presenting a definite grouping. There was an outer band representing the outline of an oval and two straight lines somewhat broken running along the long axis. All the patches with the exception of two were oval, measured 2 in. by 1 in., and were very sharply defined. The two exceptions were on the arms and were linear, starting on the extensor surface and coming round to the flexor surface. The rest of the physical examination was negative.

At a first glance purpura was suggested, but a suspicion of self-infliction was aroused by the similarity in shape and size of the majority of the patches, the curious shape, the position and distribution, and lastly, the absence of any purpuric manifestation elsewhere.

During the first examination it was easily shown that all the marks occurred on places accessible to the patient's mouth, and later we were able to prove experimentally that similar patches could be produced by taking hold of a piece of skin with the teeth and then applying strong suction with the lips. The existing patches were ringed with silver nitrate, and the patient was given ample opportunities for producing fresh ones, but none appeared. After three days the patches became brown in colour and faded in a week.

A CASE OF BLACKWATER FEVER; RECOVERY.

BY EDWARD F. GREENE, M.R.C.S., L.R.C.P. LOND.,
HONORARY CAPTAIN, R.A.M.C.

THE following details of treatment of a case of blackwater fever, which proved to be very satisfactory, appear interesting enough to warrant publication. The patient came on board the s.s. *Zaria*, West African mail boat, at Duala on July 14th, 1920, and was perfectly well up to 11 P.M. on July 22nd. On July 23rd at 1 A.M. he was taken ill, the symptoms beginning with epigastric pain, sickness, and the passing of coffee-coloured urine. The patient stated that two men employed at the same factory as himself had recently died of blackwater fever.

Course of the disease and treatment:—

July 23rd: 8 A.M., temp. 105·5° F. (phenacetin, gr. x.), water dark brown, one quarter albumin. Half a pint of hot water with one teaspoonful of salt given every half hour, 10 gr. of phenacetin every two hours. A hypodermic injection of hyd. perchor., 1 in 1000 (10 minim dose), given at 9 A.M.; temp. 9 P.M., 102·5°.

July 24th: Water slightly lighter, but redder, albumin one quarter; 10 A.M., temp. 99·5°.

July 25th: 9 A.M., temp. 102·5°. Inject. hyd. perchlor., 1 in 1000 (m x.), temp., 9 P.M., 99·8°.

July 26th: Temp. 102°. Repeat injection of hyd. perchlor. and saline solution being given continuously throughout. 9 P.M., temp. 102°; urine bright red.

July 27th: Temp. 98·4°. Saline solution still given. Albumin, trace only.

From this date the temperature continued normal, the urine became normal, and the patient made a rapid recovery. By August 3rd he was able to resume normal conditions.

I attribute the successful recovery to the continuous use of the saline solution and the injection of the 1 in 1000 perchloride of mercury solution.

A CASE OF PYORRHŒA ALVEOLARIS.

CAVERNOUS SINUS THROMBOSIS; HEMIPLEGIA.

BY R. ECCLES SMITH, F.R.C.S. EDIN.

IN THE LANCET of August 2nd, 1919, I recorded under "Intracranial Lesions" a case of the above condition which is of rare occurrence. Yet within two years I have to note a further case, demonstrating the urgent need and great value of attention to the teeth both in the adult and the child.

The patient, a girl of 24 years, had a perfect cesspool in the upper jaw. She was treated for five days for an increasing swelling of the left side of the face and œdema of the left eyelid. Paralysis of the right side ensued, and she was sent to me moribund. Pronounced pyorrhœa, ulcerative gingivitis, ulceration of the cheek adjacent, with a spreading cellulitis of the face, led the way to the cavernous sinus via the pterygoid plexus of veins. Extreme proptosis of both eyes and chemosis, especially on the left side. Involvement of the left crus cerebri by its close relation to the cavernous sinus, with corresponding right-sided hemiplegia. Œdema over the left mastoid (via the petrosal sinus) completed the ghastly picture of cavernous sinus thrombosis. Death ensued in 12 hours from profound septicæmic coma, six days after the onset of symptoms.

Apart from all the minor miseries and ill-health caused by septic infection of the teeth, I think these two fatal cases should promote further interest in the question of even compulsory dental inspection and treatment.

Barry, Glam.

DEATH OF DR. A. W. D. HUNT.—Albert William Dunning Hunt died at his residence, Heylands, Chagford, Devon, on August 27th, in his forty-fifth year, after a long illness. Dr. Hunt was highly esteemed in and round Chagford; he was devoted to the people of Dartmoor, where his father and grandfather had been in practice before him. He qualified M.R.C.S., L.R.C.P. from the Middlesex Hospital Medical School in 1899, and held the appointments of house physician at the Hospital for Consumption, Brompton, and house physician and house surgeon at the Oxford County Hospital before settling in practice. He held several public appointments and was honorary surgeon to the Moretonhampstead Cottage Hospital. Dr. Hunt will be greatly missed in Chagford, and much sympathy is felt there for his widow and three young children.

Reviews and Notices of Books.

THE PATHOLOGY OF WAR GAS POISONING.

Collected Studies. By M. C. WINTERNITZ, Major, M.C., U.S.A. London: Humphrey Milford; Oxford University Press. Newhaven: Yale University Press. 1920. Pp. xxi. + 165. 41 plates. £4 4s.

IN his collected studies, issued by the Oxford and Yale University Presses, Major Winternitz presents a handsome monograph on the pathology of war gas poisoning, based on the researches of his own department of the Chemical Warfare Service, U.S.A. The work deals almost exclusively with pathological anatomy and morbid histology of the organs of experimental animals examined at various intervals after exposure to warfare gases. The changes observed in the respiratory system during the acute period of poisoning are described with great care for each of the toxic agents dealt with, and attention is again drawn to the two main types of lesion produced: on the one hand epithelial destruction, especially in the upper air passages; and, on the other, damage of the lung capillaries with resulting pulmonary œdema. According to the degree in which one or other element predominates the gaseous poisons may be arranged in a series at one end of which stands phosgene, an almost purely pulmonary irritant, while at the other end may be placed mustard gas, which exerts its effects almost exclusively on the air passages, producing membranous tracheitis and bronchitis. Chloropicrin, chlorine, and the phenylarsines come intermediately, producing both effects; in the order named they cause successively less pulmonary œdema and more epithelial damage, the results being fairly characteristic for each individual agent. In relation to the œdema of the lungs it is remarkable that Winternitz has failed to observe the specific damage to pulmonary capillaries, with thrombosis, which British and other observers have repeatedly described; the omission is possibly due to the placing of too much reliance on special fibrin staining for the recognition of thrombi.

Following the description of the acute phenomena due to the poisons themselves there is given an account of the inflammatory changes which result from subsequent infection. In dogs, which were most often used, infection occurred with great regularity and often produced fatal results in animals which would have recovered from the effects of the gas alone. In the British experiments on goats infections played an inconspicuous rôle, and it is probable that in this respect human victims occupy an intermediate place as regards susceptibility. The section of the book which at the present time possesses the most directly practical value deals with late and permanent effects of gassing, studied at periods up to six months after exposure. The most important lesions found during this period are emphysema, bronchiectasis, collapse of lung, and obliterative bronchitis, all of which may be complicated by chronic septic foci from which acute lesions may arise from time to time. In the final chapters some preliminary observations are given on experimental lavage of the lung through the trachea with a view to washing out irritant materials which have lodged there.

The book is profusely illustrated by excellent coloured drawings. While it is improbable that this work will now appeal to a wide public, it forms a record of experimental observations of high scientific value, and it will prove an interesting and suggestive book of reference to those who may still have to deal with the late effects of gas poisoning in soldiers.

GONOCOCCAL INFECTION IN THE MALE.

By NORMAN LUMB, O.B.E., M.B., B.S. London: John Bale, Sons, and Danielsson. 1920. Pp. 328. 25s.

THIS work gives a plain straightforward account of the treatment of gonorrhœa in the male. Only those methods of treatment are described which have definitely proved successful in the hands of the author; the book is eminently a practical one, and little space is devoted to questions of theory. The description of the various methods of treatment is clear and assisted by excellent illustrations. Mr. Lumb believes that skill in the use of the urethroscope is essential to the successful treatment of gonorrhœa, and for this reason devotes considerable space to the subject of urethroscopy. This portion of the work is enriched with coloured plates illustrating the various appearances, both normal and abnormal, that are to be met with during the process of urethroscopy. A complete chapter is allocated to the subject of keratodermia blenorrhagica, in our opinion a somewhat over-liberal allowance. On the other hand, that all-important subject, the standard of cure, is squeezed into a chapter devoted to a consideration of impotence and sterility. However, in spite of certain features inviting criticism Mr. Lumb's book affords a good and practical description of the treatment of gonorrhœa. It will be useful to those who already possess a certain knowledge of the subject, but who are lacking in those refinements of technique that make the difference between success and failure.

GRUNDRISS DER PHYSIOLOGIE FÜR STUDIERENDE UND AERZTE.

Von Professor C. OPPENHEIMER (München) und Professor OTTO WEISS (Königsberg i.Pr.). Erster Teil. Biochemie, von C. OPPENHEIMER. Dritte Auflage. Leipzig: Georg Thieme. 1920. Pp. 522.

THIS volume on biochemistry is the first part of the Grundriss, to be followed by the second part on Biophysik, from the pen of Professor Weiss. The second edition, already set up in 1915, was not published until 1918, and the author, while thoroughly revising the whole work, has, in the new edition, striven to give a clear and comprehensive view of the bases of the modern physiology of the cell, and has in particular rewritten the chapters on colloids, cellular metabolism, permeability, and allied phenomena, and added some matter on the pathology of metabolism—e.g., gout and diabetes—to give the effort a more "practical outlook." The biophysical part—which has not yet reached us—will deal with general nerve physiology, the physiology of movement, heart, blood-vessels, and circulation, movement of lymph, digestion, central nervous system, and sense organs, temperature, and heat formation.

In this part 268 pages—the systematic part—are given to the chemical constituents of the animal body, wherein is embodied a sufficient account of the acyclic and carbocyclic compounds, animal proteins, ferments, antigens, and antibodies. The substances of the fatty series are first dealt with, waxes, fats, lipoids, and carbohydrates are followed by benzene derivatives, aromatic compounds, purins, then the general and special chemistry of proteins. The chapter on the ferments—i.e., enzymes—seems to us both terse and comprehensive. To hydrolytic ferments as a group the term hydrolases is applied, including esterases, carbohydrases, glucosidases, amidases, and proteases. The remainder of the text is called the analytical-physiological part and deals with the chemical functions of the tissues and the organism, including the composition of living matter, foods, metabolism, intake and transport of foodstuffs including the chemical aspects of digestion, digestive secretions, absorption blood, gaseous exchanges in lungs and tissues—secretion and excretion, regulation of functions including liver, blood-forming organs, internal secretions and hormones, and lastly, supporting tissues, nerves, and muscles.

For accessory food factors or vitamines, the term "nutramines," invented by Abderhalden, is used, and so is another of his terms—viz., "increte," for internal secretion. In dealing with the secretion obtained from the pyloric mucous membrane, Bickel's name is mentioned, but not that of Edkins. Some interesting speculations are given (p. 386) as to the significance of so-called proteinogenic amines, including histamin, adrenalin, and tyramin, and their relation to endocrine glands. As the potential substances in internal secretions are chemical in nature, their general and special physiology is relatively fully dealt with.

The book is a well-balanced exposition of what the Germans regard as bio-chemistry, the physiological significance of the chemical data being made to stand out significantly.

MILITARY SANITATION.

A Handbook for Soldiers. Third edition. By Colonel ROBERT J. BLACKHAM, C.B., C.M.G., C.I.E., D.S.O., &c. London: John Bale, Sons, and Danielsson, Ltd. 1920. With index. Pp. 140. 10*s*. 6*d*.

A BOOK on military sanitation which has reached a third edition is clearly satisfying a want. It is written for officers and non-commissioned officers of the Service generally, and can be carried in the tunic pocket. It is well adapted to teach those without a previous medical training the principles and practice of hygiene; their resulting knowledge will be very exact. The quoted opinions of great soldiers are impressive and arresting, but might be more numerous. Amongst books on military hygiene perhaps the most pleasing particular feature of this little work is that detailed schemes are put forward for regimental or orderly officers inspecting kitchens (p. 72) and sanitary areas (p. 90), telling them most helpfully, line by line, where the most probable neglects in sanitary precaution will manifest themselves, and how, therefore, they may be quickly discovered. In the next edition it might be well to develop this idea further and to suggest a routine for establishing the health administration of a battalion when first formed, dumped, for example, as battalions were in 1914, on Salisbury Plain, with possibly no one of experience to guide them. To this might be added a suggested routine for carrying on the sanitation of the battalion when it has been set going and only wants to be kept up to its level. It is noticeable that "ventilation" does not occur in the index, nor is it suggested in relation to the "protective measures" against influenza or pneumonia in the very interesting chart of infectious diseases with which the book ends. There is on p. 39 an encouraging account of how the army fitted a square peg in a square hole, and Colonel Blackham's directions for waterproofing uniform with lanoline will be found very helpful if we ever have war in Europe again. He gives a good account of boots, emphasises the valuelessness and positive dangers of flannelette, and, directing particular attention to the soldier's socks, insists he should have, or, as they say in the army, "be issued with," four pairs, one more than now allowed. The book is handy, readable, and well printed.

A MANUAL OF ELEMENTARY ZOOLOGY.

Third edition. By L. A. BORRADAILE, M.A., Lecturer in Zoology in the University of Cambridge. London: Henry Frowde and Hodder and Stoughton. 1920. Pp. xvii. + 616.

TO have reached a third edition in these days of competition among text-books of zoology argues the possession of merits of a definite order. That the author is accurate in his statement of facts is, of course, satisfactory, but does not call for so much appreciative comment as in former years when types were less stereotyped. It would be difficult to make nowadays a real "howler" in the account of the anatomy of crayfish or frog, though in former years the late Professor Milnes Marshall remarked upon the "quite curious difficulty" of weathering rocks and quicksands when dealing with the most ordinary material of zoology.

Mr. Borradaile, in producing even so restricted a work as this one, has had to grapple with whole libraries of zoology, and his problem in writing, as ours in reviewing, an elementary manual of zoology, must be mainly concerned with judgment and balance in selection. He is compelled to devote much space to some animals and to some views and to neglect others. For instance, he has said nothing at all about sponges. There would seem to be a fate in this. Two text-books, at any rate, are known to us of a more or less general applicability in which the same group is ignored. The writer may, however, be justified in neglecting a group the sterility of which has been emphasised by zoologists; sponges appear to "lead to nowhere in particular." Since this text-book is addressed mainly to medical students Mr. Borradaile is wise in laying stress upon those animals and groups of animals which have a bearing upon medicine and surgery. Parasites are dealt with fully and in connexion with disease. There are also chapters, or at least sections, upon matters of wide interest, such as Mendelism, Natural Selection, Fertilisation, and so forth; in fact, we cannot accuse the author of any serious omissions in these departments. Indeed, if more had been stuffed in something would have had to give place, and it is not easy to see what could best have been spared from what is a manual and not a treatise.

DIABETIC DIETING AND COOKERY.

By P. J. CAMMIDGE, M.D. Lond. London: University of London Press, Ltd. 1920. Pp. 222. 10*s*. 6*d*.

PERHAPS the greatest advance that has been made of recent years in the treatment of disease is to be found in the case of diabetes. In this book of Dr. Cammidge's both the busy practitioner and the patient suffering from diabetes will find set out in a simple manner the details of the newer methods. A patient of ordinary education with the information here provided will be able to coöperate intelligently with the physician in carrying out those precise changes in diet with which present-day treatment so largely concerns itself. Should complete abstinence from food be prescribed for one, two, or three days he will understand the raison d'être of the prescription and be all the more eager to carry it out. Quantitative regulation of diet, at first sight so difficult to effect in ordinary life, becomes comparatively easy to a patient trained for a week or two in weighing out quantities and learning by experience the weight of average servings of the common articles of food in the manner here suggested. Two very useful chapters deal with diabetic cookery and cookery recipes. In the latter upwards of 200 recipes serve to afford variety to what in the past, in too many instances, has been a daily round of monotonous menus. We question the wisdom of including the chapter dealing with diabetic coma in a book intended to be placed in the hands of sufferers from diabetes, nor are we convinced that "every patient should know how to test his own urine for sugar and adjust his diet according to the results obtained." Apart from these objections we have nothing but praise for a volume which meets a long-felt need.

MEDICO-TROPICAL PRACTICE.

A Handbook for Medical Practitioners and Students. Second edition. By GILBERT E. BROOKE, M.A., D.P.H., Chief Health Officer, Straits Settlements Government Medical Service, &c. Revised throughout and rewritten. London: Charles Griffin and Co., Ltd. 1920. With 61 illustrations. Pp. 522. 18*s*.

THE author has changed the title of his book from Tropical Medicine, Hygiene, and Parasitology to that of Medico-Tropical Practice, a change which has only brevity in its favour. The first edition appeared in 1908 and had a deserved popularity. The present volume contains 37 chapters, with an appendix and an index. There are some useful illustrations, and as most of the text is up to date the information should prove of value to students and tropical practitioners. We note the adoption of *Loschia* as the generic name of the amœbæ of man, but miss any reference to the recent work of Dobell and others on *Endolimax nana*, *Iodamœba butschlii*, and *Dientamœba fragilis*. This is unfortunate. Some of the old names are still retained for the flukes, such as *Opisthorchis*, which should now read *Clonorchis*, and *Cotylogonimus* instead of *Heterophyes*.

No mention is made of Noguchi's work on spironemata in yellow fever, nor is the new antimony treatment for bilharziasis dealt with. Omissions such as these are unfortunate as regards the teaching of students and impair the value of the work as an up-to-date handbook. The incorporation in a future edition of such new work will make the book of real value to students and junior practitioners. Parts of it now are excellent.

JOURNALS.

Journal of Hygiene. Vol. XIX., No. 1. July, 1920. Edited by G. H. F. NUTTALL, F.R.S.—This issue contains interesting articles on bacteriological and hygienic subjects. The attention of pathologists is drawn by the editor to the Second International Congress of Comparative Pathology, to be held in Rome in April, 1921.[1] Tetanus: Analysis of 1458 Cases which Occurred in Home Military Hospitals during the Years 1914–1918, by Sir David Bruce, K.C.B., F.R.S. This interesting and useful summary was dealt with in a leading article last week. Reference may here be made to one or two special points. Sir David Bruce shows, we think, quite clearly that the prophylactic use of serum was effective in cutting down both the incidence and the mortality of the disease, though he believes that thorough surgical treatment of wounds was of very great importance. The therapeutic use of serum was, however, disappointing, as was to be expected from the knowledge already gained before the outbreak of war. Professor Sherrington's work, which established the intrathecal route as the best for administration of the serum, is referred to. Anaphylactic shock occurred in 49 cases of tetanus treated with serum, with 12 deaths. Of these cases of shock, 17 were caused by intrathecal injections, 14 by intravenous, 9 by intramuscular, and 2 by subcutaneous. Anaphylactic shock was thus not a rare phenomenon.—A Study of the Serological Reactions of Meningococci and an Account of the Method of Preparation of Antimeningococcus Serum, by A. Stanley Griffith, M.D. The first part of this long article is devoted to an account of work on the separation of types of meningococci by means of the agglutination reaction. The author concludes that "Gordon's classification holds good if care is taken in the selection of strains for the production of type sera," but that "all the strains included in each type are not identical in their serological characters," and that "there is inter-relationship between the types." In the second part of the paper Dr. Griffith discusses the methods of preparing anti-meningococcal serum.—Carriage of Coliform Bacilli by the Oriental Hornet (*Vespa orientalis*, Fabr.), by P. A. Buxton, M.A., M.R.C.S. The author examined, by dissection and by plating on McConkey's medium, the gut contents of the large red oriental hornet which is common in Mesopotamia. The hornet is a foul feeder, and Dr. Buxton shows that of 64 examined 23 were carrying well-known types of intestinal bacteria.—On Defence Rupture and the Antagonistic Action of Salts, by C. Shearer, F.R.S.—Report of Experiments on the Cold Storage of Herrings Carried out at North Shields (June and July, 1919), by Ione H. Green. The author draws the following conclusions from the work described in this paper—that brine-freezing is more satisfactory than dry-freezing, and that ungutted frozen fish keep better than gutted ones. The need for the most elementary measures of cleanliness in the handling of fish is pointed out. At the present time apparently waste is common owing to the lack of proper organisation in the fishing industry.—An Inquiry concerning the State of Cleanliness of Empty Milk-churns, by R. H. Cumming and A. T. R. Mattick. It is shown in this investigation that the present inadequate methods of washing and cleansing churns is one cause of the loss of milk through souring in transit.—Suggestions for a New Criterion of a Positive Wassermann Reaction Based on an Analysis of 2334 Quantitative Tests, by C. H. Browning and E. L. Kennaway. The new criterion is "based upon a comparison of the amounts of complement giving complete lysis with any given serum, and with the negative control, respectively." The article will be read and studied by those who are occupied in carrying out the Wassermann reaction.—The Milk-supply of the City of Edinburgh, by A. Cunningham and B. A. Thorpe. The authors examined 40 samples of milk from the supply of the city of Edinburgh, and found that the bacterial content was of about the same order as that reported from other large cities. They recommend the reductase test for obtaining a rough idea of the numbers of bacteria present in milk.—The Wilson-Weil-Felix Reaction in Typhus Fever, by W. James Wilson, M.D., D.Sc., D.P.H.—This article gives a valuable historical account of the reaction as diagnostic in typhus fever. The author suggests that the explanation of the occurrence of agglutinins to the proteus bacillus X19 is that in typhus fever a bacterium, which is a normal inhabitant of the human intestine, gives rise to agglutinins for itself and group agglutinins for numerous other organisms, especially X19 and X2 proteus bacilli.

Quarterly Journal of Microscopical Science. Edited by Sir E. RAY LANKESTER, K.C.B., F.R.S., &c., with the coöperation of Professors HICKSON, F.R.S., GILBERT BOURNE, F.R.S., J. GRAHAM KERR, F.R.S., and E. W. MACBRIDE, F.R.S. Vol. LXIV., Parts 2 and 4.—*Journal of the Royal Microscopical Society.* Edited by C. SINGER, M.D., with the assistance of Professor J. ARTHUR THOMSON, LL.D., Messrs. DISNEY, I. G. RAWLINS, Dr. RENDLE, F.R.S., and Dr. R. ST. JOHN BROOKS, M.A., M.D. 1919. Part 4; 1920, Part 1.—The two parts of the *Quarterly Journal of Microscopical Science* noticed here contain between them seven memoirs, all of which are of importance.—In a memoir on "Determination of Age in Honey Bees," Mrs. Goodrich states that these insects die not only from various bee diseases or from violence, but perish worn out by work and old age. It would appear that in the height of the honey-flow worker bees literally work themselves to death about six weeks after hatching. Mrs. Goodrich points out that such bees, not suffering from any bee disease, can not only be recognised by their worn appearance and frayed wings, but an examination of the brain cells establishes their senile condition. Figures of these cells in freshly hatched insects and in those of greater age show obvious degenerative changes in the latter. From the economic point of view it is clearly important to be able to distinguish between those insects which are suffering from a possible unknown bee disease and those which are merely senescent and dying.—A second paper of great interest, by Professor Hickson, concerns the rediscovery of *Protohydra leuckartii* in this country. Originally—and as long ago as 1868—Professor Greeff found this simple organism—which is practically a hydra without tentacles—at Ostend, near which town it was again found in 1892. It has now cropped up in tidal marshes near Southampton, and in a postcript Professor Hickson announces that further specimens have been found near Plymouth. He details such facts as he has noted from the examination of abundant material regularly supplied to him at various periods of the year; hitherto he has been unable to find any trace of any medusa stage.—As to the other communications in the journal Professor Gemmill continues his well-known studies among the Echinodermata in a memoir upon the development of *Crossaster papposus*, while Mr. Bronte Gatenby continues his series of articles on the Cytoplasmic Inclusions of the Germ Cells.——The *Journal of the Royal Microscopical Society* contains, as usual, a few memoirs read to the Society, and a mass of abstracts of current research on both animals and plants. The latter, as has been customary in recent years, bulks most largely, and is of the greatest use to workers in all departments of biology. It forms a useful supplement to the lists of titles of papers published annually in the Zoological Record, and its value is enhanced by a few woodcuts. It includes a good summary, with three illustrations, of the recent well-known investigations on the "spiroptera cancer" in rats, with special reference to the part played by the cockroach.

British Journal of Experimental Pathology. Vol. I., No. 3. June, 1920. Editors: C. H. BROWNING, P. FILDES, W. E. GYE, E. L. KENNAWAY, E. H. KETTLE, J. MCINTOSH, J. A. MURRAY, W. J. TULLOCH, C. M. WILSON. London: H. K. Lewis and Co., Ltd. Price 7*s.* 6*d.*, annual subscription £2.—The third number of this journal maintains the high standard of previous numbers. A leaflet is enclosed containing a series of summaries of all the papers published up to the present in the journal. These summaries are concise, and are printed in small type, occupying just enough space to be convenient for a card-index system. This novel and useful innovation is apparently to be continued in subsequent issues. The Antigenic Properties of *B. psittacosis*, by H. M. Perry. The organism was isolated from a grey touracou native to South Africa. The investigation was undertaken to establish the identity of the organism. It was found that the antigenic properties of the bacillus are identical with those of the "mutton" type of *B. aertrycke*.—A Method for the Estimation of Urea by Soy-Bean, by E. L. Kennaway. The method detailed is simple, gives accurate results, and should therefore be of great practical importance in the clinical laboratory. Amounts of 1 mg. of urea can be estimated by the method with an accuracy of 97 per cent.—The Value of the Vital-red Method as a Clinical Means for the Estimation of the Volume of Blood, by D. T. Harris. The method of estimating the volume of blood by means of innocuous dyes depends upon the introduction into the vascular system of a known weight of the dye, and then, after allowing time for the dye to become uniformly distributed and before passage of the dye from the vessels begins, to take a sample of blood and estimate the concentration of the dye therein. Vital-red is, from the standpoint of safety and simplicity, the most useful substance for the determination of the blood volume of man. Its reliability has been tested by Dr. Harris, who finds out that, owing to the rapidity with which vital-red leaves the vessels, the method gives results which are too high. The optimum interval for taking a blood sample is two to two and a half minutes. The correction-factor for cats and dogs for a four-minute interval is 0·78, for a one-minute sample 0·9. For man the correction-factor probably lies between 0·8 and 0·9.—The Ætiology of Influenza, by P. Fildes and J. McIntosh. This article completes the review of the subject begun in the previous number. The authors weigh the evidence for and against the view that influenza is caused by a filterable virus, and conclude that the balance is against this view. Finally, the conclusion reached is favourable to the view that *B. influenzæ* is the specific microbic agent in influenza.

[1] See THE LANCET, August 21st, p. 411.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 11, 1920.

The Physician in the War.

UNDOUBTEDLY the surgeon had the time of his life during the years 1914 to 1919. He then obtained more operative practice in a few short months than would otherwise have fallen to his lot in a lifetime. He enjoyed skilled coöperation, with abundant opportunity of mutual help and counsel. In view of the circumstances no leave had to be wrested from relatives for performing biopsies or autopsies. The services of bacteriologist, registrar, and statistician were at his elbow. Surgeons from all parts of the country and from many civilised lands got to know each other as friends and professional colleagues, with lasting advantage to the fraternity of surgery. No wonder surgery made great advances. The time of the physician came later, and never so completely. The war needed him just as much, but at the outset no one in authority was clear-sighted enough to see this, although it is now obvious that the early recognition of epidemic disease was a matter on which the lives of thousands and tens of thousands might hang. The official stage appeared complete with the trilogy of surgeon, sanitarian, and bacteriologist, and although the diagnosis of all known and some unknown infectious diseases was in reality a task for the highest medical ability, it was not until the campaign was half over that the consulting physician began to take his due share in affairs on the field of battle and behind the lines. What this share was is attractively portrayed in the first Lumleian lecture, which we print on another page.

War conditions made the physician's work essentially different from that of civil practice. In the first place the opportunities of group study were almost boundless. Not only infectious diseases but maladies of all kinds were notified, and during the latter part of the campaign facilities were such that the physician could take his choice of a syndrome which interested him and work it out in various areas of the vast field of hostilities. In spite of the great relative improvement in hygienic conditions since the Crimean war, of which sanitarians never weary of telling us, and the remarkably small proportion of disease during the whole campaign, still, as Sir JOHN ROSE BRADFORD reminds us, the actual numbers of sick were far larger than those of wounded. Interest was not limited to the diseases generally recognised in association with campaigning. Typhoid, cerebro-spinal fever, trench fever, dysentery, and the like, had their special attraction to clinician and epidemiologist, but an impetus was also given to the study of such everyday disorders as acute rheumatism and lobar pneumonia. Sir J. ROSE BRADFORD remarks on the rarity of acute rheumatism in the field. With an unprecedented population of young males and a very large population of young females, exposed, as never before, to the rigours of wet and cold, this immunity would have been astounding had not Sir ARTHUR NEWSHOLME, when medical officer at Brighton, prepared us to associate acute rheumatism with dryness and warm spells of weather. The war-time physician has established beyond a doubt this observation of the peace-time sanitarian. During his whole service in France Sir J. ROSE BRADFORD saw no death from acute rheumatism nor any case of rheumatic hyperpyrexia. Acute infective endocarditis, when it occurred, developed, as a rule, on healthy valves, and only rarely as an incident of gunshot sepsis. So much for rheumatism. The war also gave Dr. ADOLPHE ABRAHAMS his opportunity of studying lobar pneumonia in a large population of recruits at Aldershot. His analysis on p. 543 of the frequency of symptoms and complications has the special value arising from uniform observation, for the cases all came under his own eye. He had, unfortunately, no opportunity of making an exhaustive survey of the troops in order to define the relation between constitution and susceptibility—he was not even able to obtain, when he wanted them, the figures of the monthly strength in the Command—but he did adduce the striking fact that 62 per cent. of his total cases fell sick of pneumonia within 12 days of joining up. And this was before the influenza pandemic began. The total mortality of his 558 consecutive cases was just under 11 per cent., being markedly less than the 30 per cent. of the Johns Hopkins Hospital and the 17 per cent. of the Middlesex Hospital (1880–89), both observed on about the same number of cases, but greatly in excess of the 3·6 per cent. (quoted by Osler) among 40,000 picked men in the German army. Double pneumonia had a threefold mortality—namely 29 per cent. Herpes labialis was reinstated in its position as signum bonum—occurring, indeed, only in 17 per cent. of the whole, but heralding a mortality in these of little more than 4 per cent. The seventh day proved to be far the most popular day for the crisis, which is more credible than Dr. ABRAHAMS'S singular confirmation of the old legend that the critical fall affects the odd day in general. Empyema was unduly frequent in the Aldershot cases, even before the influenzal epidemic which stamped it as a common and very fatal complication. Dr. ABRAHAMS notes the large proportion of cases in which simple aspiration was sufficient to clear up the effusion.

Over and above the enrichment of the differential study of disease afforded by the circumstances of war, Sir J. ROSE BRADFORD'S experience gave him a further opportunity of great interest, that of comparing the incidence and mortality of disease in the various nations represented among the British forces. The actual attack-rate of tuberculosis was much the same among English, Canadian, and Australian contingents, whilst among the New Zealanders it was much higher. On the other hand, the resistance to tubercle displayed by the men of home origin was vastly greater than that of the Maories or of the natives of South Africa and the West Indies, men from the Dominions coming intermediately between the two extremes. No single instance of chronic or quiescent tubercle was found among an extensive series of autopsies on men of native races, although in over half the total find of pulmonary tuberculosis the lesion was quiescent. Racial variations in immunity, whatever their explanation may be, are of great interest. Obviously the material for comparison of the infectivity and virulence of disease among men of various races should be available in abundance, and the time should be approaching when analysis and classification of this experience will be available. The Lumleian lectures will make a fitting introduction to this important chapter in the medical history of the war.

Anatomical Terminology.

ANATOMY is a subject which extends far beyond the horizon of the medical student and the ordinary usage of the great majority of practitioners of medicine, so that there is nothing surprising in the fact that many of its terms have a significance for the follower of the science which they do not possess for those who only concern themselves with descriptive human anatomy. For these last they are often merely "labels," sound and fury signifying little, the evil inventions of the malevolence of terminologists. But let it be remembered that anatomy is a living science apart from medicine, the technical language of which includes its nomenclature, and it becomes evident that this language must also be living, and must come under the laws which apparently govern all living things. It is comparable with any national tongue, subject—like that tongue—to evolution under changing circumstances, and it will only reach its final form when it becomes a dead language. Philologists would be puzzled to assign reasons above criticism for the survival of some words in a language, and for the decay of others which would appear to be suitable for retention, yet such happenings are but the common results and evidence of the gradual evolution of a tongue, and similar changes have taken place and are taking place in anatomical nomenclature. Moreover, it seems that this natural evolution cannot be changed, hurried, or replaced by artificial means. The factors which mould languages in different ways under different suns may be elusive, but they are none the less effective in their action. Both these effective agents are traceable in the different languages of anatomy. Those who are acquainted with the old literature of the subject know of many examples of descriptive labels which, at first in common use, have undergone different changes in different countries as the study became less international and more in keeping with national modes of thought. We have, in the Basle Nomina Anatomica (1895), a serious attempt to impose an artificial formal terminology on the world of anatomy, as if the Tower of Babel were no longer worthy of consideration. Already those who have taken it up are suggesting various changes in it, and the suggestions from different countries do not by any means coincide in their tendencies. This is not surprising, and is only on a small scale what we should expect if an attempt were made to put Volapuk in place as a substitute for all the tongues spoken to-day.

It would seem probable that the B.N.A. in its present form will fail to hold its ground, in spite of its capture of some literary strongholds, even as BARCLAY'S proposals failed a century ago. No doubt certain of the terms will survive, as some of BARCLAY'S have survived, but this will be on account of their applicability and English fitness from the evolutionary standpoint, not because they are at present on the Basle list. In our last issue Dr. CUTHBERT MORTON summed up his efforts in the cause of "simplification" of anatomical language in an interesting and entertaining paper. Once more it seems probable that this scheme will yield a few additional or alternative terms to the literature, but its ultimate fate may be that of every attempt to force the hand and influence of time. Dr. MORTON brings together, and endeavours to meet, many of the complaints urged against the anatomical language of the schools. These complaints and accusations crop up from time to time, and it may be of interest to consider some of them. It is said frequently that much confusion exists between the terminologies, and valiant efforts are made to cure this confusion by adding to it; or the confusion is referred to the use (or existence) of several names for one thing. But surely one of the signs of vitality and richness in a tongue is the possession of synonyms and words with progressive differences of meaning, and the occurrence of different terms in anatomical nomenclature is usually an indication of increasing and widening knowledge, and a necessary accompaniment of the effort towards perfection which is the keynote of evolution. A language which does not change with time, and increase in volume, is dead. Where several terms exist for one thing, one of them tends from its fitness to be used, and the others become secondary and, in some cases, disappear. Again, it is urged that the student is overcome by the difficulty of the labels that he must acquire. Teachers of experience deny this altogether, and hold that he has no more relative difficulty in acquiring the terms of anatomy than in learning the technical words used in the half-dozen games which he plays. It may be pointed out, moreover, that successful teachers of anatomy are not formal in their methods, for pedantry and formality are closely associated, and neither makes for inspiring teaching.

Confusion in the use of terms of position is another evil laid to the charge of the present nomenclature, and laid there unjustly, for in practice no confusion arises when the terms are used by anatomists, and if confusion is present in the student's mind it must be referred to want of instruction in his early days, not to inherent defect in the system of nomenclature. All who teach changing classes must have seen the limitations imposed on students by their ignorance of dead tongues which still live in their widespread influence, and when Dr. MORTON, for instance, describes the student as overcome by the complexity of the labels to be remembered, the blame may really lie, not on the anatomical terms, but on the faulty education of the student which does not enable him to make use of the information furnished by those terms. It would be as reasonable to refer the misuse of words by the illiterate to shortcomings in the English language itself. Most of the forms found in anatomical works of to-day are relics of that time when Latin was the common tongue in which all learned books were written. Latin and Greek words of this sort have been adopted into English; we talk of the biceps, the extensors, the larynx, the trachea, and so on, and these names seem to us almost as English. Many of the names given to muscles are used as nouns, whereas they started in life as adjectives. Greek and Latin terms which have come through the evolutionary mill are becoming anglicised, and it would probably be impossible to uproot them even if it were desirable to do so. But the use of Latin to-day is on a different footing. It may have international value, although this is probably overestimated; those who are in the habit of reading foreign literature have no difficulty in fitting the English equivalent to the foreign term, and it seems unnecessary to introduce a third class to stand between them.

Respiration and Fitness.

THE application of physiological knowledge to practical purposes has probably nowhere been more useful than with regard to the principles of respiration; prolonged storage of cereals has been rendered possible by conditions which make respiration impossible for the destructive weevil; caisson disease has ceased to be an unpreventable accident since the principles underlying the absorption of gases by the blood were employed to illuminate its mystery; while for the construction of mine rescue apparatus a grasp of these principles is fundamental. Nothing creates a stronger appeal to humanity than news that owing to a colliery explosion a number of men are incarcerated in the workings, dependent on the immediate exertions of others for their release. Volunteers are always ready to risk death in the attempt, and many noble lives have thus been lost. Science teaches that no attempt should be made unless the rescuers (1) are suitably protected against the dangers they must face, dangers associated with the poisonous atmosphere they must enter; and (2) are physically fit to undertake the endeavour. A Committee appointed by the Department of Scientific and Industrial Research to consider mine rescue apparatus in a first report[1] issued in 1918 laid down certain stringent requirements based on physiological principles. This Committee has continued its work, and in a second report[2] recently issued shows how these requirements can be fulfilled. The report deals in succession with the two points mentioned above. The various types of rescue apparatus are discussed, and the compressed oxygen apparatus, designed by Dr. HENRY BRIGGS, a member of the Committee, is carefully described. The underlying principles are the same as in all other types; oxygen is supplied to the wearer from a cylinder he carries, and the carbon dioxide he exhales is absorbed by caustic potash. The apparatus cannot be explained with justice without entering into technical details of construction, and the reader should refer to the report itself to appreciate the advantages which belong to the BRIGGS apparatus; it is enough here to say that it reflects credit on its designer and fulfils the necessary requirements.

Not the least interesting part of the report is that dealing with physical fitness. Here we trace the scientific mind of Dr. J. S. HALDANE, a member of the Committee, speaking on a subject of which he is the accepted master. A remarkably clear and concise summary is given of the processes of respiration; the way in which the pressure of carbon dioxide in the blood acts independently of the oxygen pressure is emphasised; and attention is drawn to the different and independent action of oxygen-want and carbon dioxide excess in stimulating respiration. Evidence is quoted (*a*) to show that while in an ordinary person diffusion of gases through the pulmonary epithelium will explain the access of oxygen to the blood, "the physical laws of diffusion do not explain the phenomena of blood-oxygenation when the subject is making a special demand on oxygen-supply" either because he is doing physical work or because, as airman or mountaineer, he is breathing rarefied air; and (*b*) in support of "the view that the epithelium is not a mere porous diaphragm, but that the living cells from which it is built possess the faculty—which they exercise at need—of secreting oxygen from the air and of handing it forward at enhanced pressure to the blood." An interesting and new point now emerged—men in good physical training, such as practical miners, were found to possess this power of secreting oxygen from the air.

"Hence, in men who are accustomed to muscular exertion, there is no deficiency of oxygen in the arterial blood when ordinary air is breathed until exertion is pushed to the utmost. For this reason they also receive no benefit from breathing air enriched with oxygen. On the other hand, in men who are not accustomed to muscular exertion, the epithelium fails to pass in the proper supply of oxygen unless the diffusion pressure of oxygen is raised in the alveolar air by the enriched inspired air. Hence these persons benefit by enrichment of the air with oxygen. ..... It is evident that the physiological response of a man to oxygen during muscular exertion furnishes an interesting test of whether or not he is in good training as regards his lungs. Physiological fitness depends not only on the lungs, but also on ready adaptation of the circulation, muscles, nervous system, &c., to whatever exertions are required. ..... In ordinary cases, however, lung fitness is an accompaniment of general physical fitness, and may therefore be taken as a measure of it."

We have quoted Dr. HALDANE'S ingenious reasoning at some length, as it is apparently at variance with the views of Mr. J. BARCROFT, given in his own words in our issue of last week. Mr. BARCROFT, it will be remembered, supported his thesis by exact and quite heroic experiment on himself; but we do not know whether Dr. HALDANE would admit that he was in good physical training at the time of his sojourn in the glass-cell. Based upon the reasoning quoted above, Dr. HALDANE has evolved a method of testing physical fitness which has been used for airmen, and should also be applicable to members of a mine rescue brigade. The method, described in an appendix by Dr. BRIGGS, should be submitted to further tests, for if its value be confirmed it will be useful in other fields; for example, to test the capacity of athletes to endure the strain of strenuous and prolonged exertion, say for a contested boat-race. A further instance of the practical value of the research carried out is to be found in an estimate, contained in the report, of the most energy-saving rate of walking—a matter of importance to the economical movement of infantry. "Like a steamer or an airship, a man has a most economical speed at which he goes furthest per litre of oxygen or per pound of food." The investigation revealed that when carrying a load of 43 lb., the weight of a rescue apparatus, the most economical speed for certain subjects was 3 miles an hour and for others 4 miles; the subjects, however, were walking along an even surface, and "under the conditions obtaining in the mine we judge that rate to be about 2½ miles per hour when travelling a flat road and carrying a rescue apparatus." The speed fixed may be compared with that stated by AMAR,[3] who places the most economical rate of walking along a flat surface at 2·8 miles per hour, but considers that if a weight of about 45 lb. is being carried the pace should be slowed down to 2·6 miles. It can now be gathered that the research published in this report is of first-rate importance; the work is still being continued, and further valuable results may be expected.

[1] THE LANCET, 1918, ii., 361.

[2] Second Report of the Mines Rescue Apparatus Committee, Department of Scientific and Industrial Research. 1920. H.M. Stationery Office. Pp. 60. 2s.

[3] Amar, Jules: The Physiology of Industrial Organisation. Translated by M. Miall. Library Press, Limited. 1918.

Annotations.

"Ne quid nimis."

NYSTAGMUS AND ILLUMINATION.

THE getting of coal from deep measures, upon which, as is being so forcibly impressed upon us this month, modern life depends, was rendered possible by Newcomen's steam engine invented in 1712 for pumping out water-logged mines. Then Watt improved the invention for use in mines and elsewhere. Forthwith the working of deep coal measures became practical, and industrial expansion a possibility; but all was for a moment checked by danger to life and limb from explosions. Another invention followed, the Davy lamp; the public owe it much, for through its use coal has been got which otherwise must have been left in situ. But for the miner this lamp has been a mixed blessing. It has carried him deeper and deeper into the earth into places fraught with danger; it condemned him to asthma until ventilation came to his rescue; it has limited his illumination and afflicted him with nystagmus. This latter disease has received considerable attention of late years. An excellent paper on its economic aspect was read at the Brussels Congress of the Royal Institute of Public Health by Dr. T. L. Llewellyn, an expert authority on the subject to whom the miner owes much for his steady insistence on bringing the facts forward. This paper appeared in the *Colliery Guardian* of June 4th, and has now been made accessible to medical readers in the current number of the *Journal of State Medicine*. The prevalence and distribution of the disorder have become known owing to its inclusion among diseases for which compensation must be paid. Its prevalence discloses that 6000 miners in England and Wales are disabled on its account each year; its distribution establishes that the disease is unknown in metalliferous mines; that among coal-miners only coal-getters are affected, and only coal-getters in mines where safety lamps are used. The disease is not confined to the United Kingdom, but prevails among miners in Germany, Belgium, and the North of France, whereas in the United States, notwithstanding inquiry,[1] the disease does not appear to be prevalent.

The symptoms of the disease are now accepted; the distressing psychology they give rise to is becoming recognised, but the pathology remains obscure. Fortunately the distribution of cases establishes clearly the relation the disease bears to inadequate illumination and points to the means necessary for prevention. The difficulty with the safety lamp is that the gauze around the light cuts off many rays, and the illumination becomes less and less as work proceeds and coal-dust collects on and blocks up the mesh of the gauze. Dr. Llewellyn, who has measured the light in mines, calculates that "the amount of light acting on the retina may be so small an illumination as only 0·0018, or roughly 1/2000th part of a foot-candle. ..... Up to 1914 over 90 per cent. of the safety lamps in use gave less than 0·5 c.p. at the coal face." A standard illumination of 0·1 foot-candle over the whole working area is called for, and illustrations are given showing the advantages gained through whitewashing and stone-dusting the roads. The cost to the mining industry in compensation paid and loss of coal output is estimated at over 1 million pounds a year; nor does the harm stop there, since the loss of coal affects other industries, and the direct loss to the nation approximates at 1*d*. per ton of coal raised.

At the same Congress at which this valuable paper was presented Dr. F. Shufflebotham, another well-known writer on this disease, when putting forward a case for the science of industrial medicine, claimed that although miners' nystagmus was the commonest occupational disease known to medical science, it was only one of the several occupational diseases affecting miners, and only one of many disabling conditions at present hardly recognised by the medical profession as affecting the general working population. Dr. Llewellyn states that steps are being taken to discover and introduce more effective and equally safe illumination for fiery mines. Necessity is as much the mother of invention now as when Newcomen invented the steam pump. Necessity is surely present in this case, and we hope that in the near future the problem will be solved. Then miners' nystagmus will disappear, as miners' asthma has already done. Relief from disease and danger may, as Professor E. L. Collis suggested last week in a letter to the *Times*, go hand in hand with a cessation of the fretfulness that threatens to paralyse industry.

[1] Miners' Nystagmus, F. L. Hoffman. 1916. Washington.

WORK OF THE GOVERNMENT LABORATORY.

THERE has evidently been heavy pressure upon the staff of the Government Laboratory during the year ended March 31st, 1920, judging from the details given in the annual report just issued and signed by Sir James J. Dobbie, the principal. The returns constitute, in fact, a record. The total number of samples examined in the course of the year, including those dealt with at the outport chemical stations, was 368,898, as compared with 289,180 in the preceding year, an increase of nearly 80,000. The examinations represent therefore the passing through the laboratories and stations of over 1000 samples a day. The number examined at the Central Laboratory alone (Clement's Inn) amounted to 199,388, against 184,392, an increase of approximately 15,000. As is stated in the Appendix, the principal increases are due to goods liable to customs duty, such as wines, sugar, tea, and cocoa preparations, and the volume of work here seems to be a sure indication of the revival of trade after the return to peace conditions. Conversely, large decreases are shown in the samples submitted by such Government Departments as the Admiralty, Air Ministry, and the War Department. The report shows a deterioration in the quality of tea, since of 16,562 samples examined 6695 were reported against, or 40 per cent. of those examined. It is interesting to note that tea is examined at the port of entry by tea inspectors, and doubtful samples requiring a more complete examination than is possible by these inspectors are sent to the Central Laboratory. The increase (representing a much larger return than in pre-war times) is attributed again to a revival of trade, the tea imported last year amounting to over 500 million pounds, as compared with about 370 millions in the year ended March 31st, 1914. Restricted times in regard to the sale of alcoholic drinks may have some bearing upon this increase in tea consumption. By far the greater part of the samples rejected was owing to the presence, it is stated, of foreign matter accidentally swept up with the tea, and not to intentional adulteration. On the whole, therefore, the tea supplies were satisfactory, and indeed, considering the difficulties of the situation, the imported food commodities in general approached quite a good standard. Passing to the control exercised by the Government Laboratory over the work of the public analysts of the country under the Sale of Food and Drugs Acts, in the majority of referred cases (121 samples in all) the analyst's conclusions were upheld. The most important cases were as follows:—

Butter.—One sample contained foreign fat and one excess of water, as alleged by the public analyst.

Vinegar.—Both samples consisted of artificial vinegar, as alleged.

Cream of tartar.—The results agreed with those of the public analyst, who had found an excessive quantity of lead in the samples.

Beer.—The samples were referred by magistrates in connexion with proceedings under the Beer (Prices and Description) Order, 1919. In one case the original gravity differed from that found by the public analyst. In the remaining seven cases there was no information as to the finding of the public analyst.

Whisky and gin.—The point in dispute in the case of all the samples was the alcoholic strength; but it is not known whether or not the results were in agreement with those of the public analyst.

In the case of ginger alleged to contain spent ginger, the results did not agree with those of the public analyst.

In the case of canned peas alleged to contain copper, camphorated oil alleged to be deficient in camphor, mustard alleged to contain foreign starch, and bicarbonate of soda alleged to contain arsenic, the results agreed with those found by the public analyst.

In the 89 cases of milk samples in which certificates were issued the charges were as follows: in 26 cases, added water; 45, abstraction of fat; 6, added water and abstraction of fat; 2, presence of preservatives; and 10, presence of dirt. In 7 cases the results were not in agreement with those of the public analyst.

The smooth working of these Acts must have been much disturbed through the period of the war, inasmuch as regulations varied from time to time in regard to the constitutional requirements of certain foods, in accordance with the regulations issued by the Food Control Board. But the pleasing indications of this report are that we are steadily approaching normal conditions again in regard to the "nature, substance, and quality demanded" of the commodities concerned.

ACUTE DIFFUSE PERITONITIS.

IN a recent issue of the *Journal of the Royal Army Medical Corps* Major Basil Hughes, R.A.M.C., (T.F.), describes a treatment for acute diffuse peritonitis which in his hands has saved 20 out of 21 serious cases. The peritoneum left to itself can deal with infection if not too massive, but it is hampered by distension of the intestine which restricts it blood-supply, while vomiting reduces the fluid available to form curative exudations. Major Hughes relieves the condition by whatever operation is required, with as little disturbance as possible to the peritoneum and a minimum of drainage. The subsequent course of the patients is almost regular, and they do not have distended intestines. Subcutaneous saline, 10 pints in 24 hours, is given for two days, and is then reduced to five pints until the vomiting, which has gradually been becoming less frequent and clearer in colour, ceases on the fourth or fifth day. Morphia, $\frac{1}{4}$ gr. every eight hours, and atropine, $\frac{1}{100}$ gr. every 12 hours, for the first three days, have "splinted" the intestine. Copious drinks of water containing sodium bicarbonate and citrate, given from the beginning to wash out the stomach and allay thirst, have secured by the third day free diuresis. Flatus is passed on the third, a foul stool probably on the fourth day. Glucose is given all the time per rectum. When vomiting ceases food is given very gradually by the mouth. Castor oil on the tenth day, and after that diet may be cautiously increased. Illustrative details are given in the article.

A PIONEER IN SPIROMETRY.

Spirometry, or the measurement of vital capacity, has gone through many vicissitudes since its introduction at Brompton Hospital by Dr. John Hutchinson in the early part of last century. Professor G. Dreyer dedicates his recent exact study[1] of the use of this measurement in assessing physical fitness to the memory of this Dr. Hutchinson, of whom the following biographical details are available. John Hutchinson was the only son of James Hutchinson, of Ryton, near Newcastle-on-Tyne. He was born in 1811 and received the more important part of his education at University College, London, then recently established to meet the needs of students debarred by theological tests from attending the older universities. Sir Charles Bell had been teaching anatomy in London since 1806, and his studies of the nervous system and its relation to respiratory movement resulted in his appointment as professor of physiology at the College, Dr. Dionysius Lardner, the versatile scientific writer and encyclopædist, being professor in natural philosophy and astronomy. These were John Hutchinson's teachers. He was not only a hard-working student, but soon became a teacher, lecturing first at the various metropolitan institutions and later in his native town. He was accustomed to visit the coal mines and to study the common causes of accident. He was elected M.R.C.S. in 1836, and undertook work at the Southampton Dispensary, Leigh-street, London, but his interests centred in scientific rather than clinical medicine. He made numerous experiments on the conducting powers, dryness, and resistance to the progress of fire of materials used in building houses, and published a work on the subject in 1843. In 1842 he was elected a Fellow of the newly established Statistical Society. His knowledge of coal gases led him to adapt the principle of the gasometer to measure the quantity of gases used in respiration. He made observations on nearly 4000 people, and tabulated the results according to height. He also used a mercurial gauge to measure the inspiratory and expiratory pressure, and tabulated the results according to professional or industrial occupation. He communicated papers embodying all these tables to the Society of Arts and to the *Quarterly Journal* of the Statistical Society of London in 1844, publishing his results later in a booklet entitled "The Spirometer" (1852). After his appointment to the position of assistant physician to the Brompton Hospital he began to measure the vital capacity of the patients suffering from chest trouble, and urged the general use of the spirometer in the detection of early or threatened phthisis. He was awarded the degree of M.D. by the University of Giessen in 1846. He communicated a more extended description of his studies in respiration to the Medico-Chirurgical Society of London in 1847, which was translated into German and published as a separate pamphlet in 1849. His other contributions included papers on heat, malaria, and ventilation to the *Journal of Public Health* (1848) and an article on the thorax for Todd's Encyclopædia of Anatomy and Physiology. He gave valuable evidence before a Select Committee of the House of Lords on the Prevention of Accidents in Coal Mines. He must have been a versatile man, for we read: "He was also gifted with an exquisite ear for music; his execution on the violin was masterly. He had a great ability as a draughtsman. He sculptured admirably in bas-relief and painted in oils." His restless spirit was constantly searching for new outlets. Soon after the discovery in 1851 of gold deposits in Australia he left England and began to make extensive collections of various gold-bearing rocks which he intended should become the property of the British Museum, but for some unknown cause they found some other destination. Of his career in Victoria for the next eight years nothing is known, and it does not appear that he made any further contribution to science. In 1861 he travelled to the Fiji Islands, dying there in July of that year.

[1] The Assessment of Physical Fitness. Cassell and Co. 1920. 10s.

"APPARENTLY DEAD."

THIS is the title of an interesting note by Mr. W. G. Spencer in the September issue of *Medical Science*. He cites a case described[1] by E. Rautenberg which would have been buried alive, had it not chanced that the coffin was reopened for purposes of identification. The woman had been reduced to the state of a hibernating animal by an overdose of morphia and by cold. The doctor who examined her in the mortuary applied only one special test, that of dropping sealing-wax on the skin. He made no note of the state of the pupils, which were subsequently found contracted. The details are as follows:—

On Oct. 27th, 1919, a hospital nurse, aged 23, bought from an apothecary in Charlottenburg for 20 marks 50 c.cm. of a 3·5 per cent. solution of morphine, and 10 powders each containing 0·5 g. of veronal. She then went into the Grünewald, and about 4 P.M. swallowed about 1·7 g. of morphine and 5 g. of veronal. She wandered about as in a dream until she lost consciousness. The weather was cold, the temperature during the night being 1–3° C., and wet.

When she was found the next day, she was assumed to be dead and was taken to a mortuary, where the medical officer of the district examined her. The body had a deathly pallor; there was an absence of pulse, of respiratory movement, of the heart sounds, and of all reflexes. There was partial

[1] Ein bemerkenswerter Fall von Scheintod. Deutsche med. Wchnschr., 1919, 45, 1277.

stiffness of the trunk and limbs, and it was assumed that rigor mortis was as yet incomplete. There was no reaction to sealing-wax dropped on the skin. There is no mention of the state of the pupils. After the examination, the body was put in a coffin, still in the wet clothes. Fourteen hours later, on October 29th, the coffin was reopened in order that a lawyer might identify the body. The undertaker's men then noted that the cheeks were coloured blue and that there was a slight movement of the head. The same medical officer was again called and now heard faint heart sounds, but there was still an absence of a pulse and of respiratory movement. The patient was then moved to a hospital, when at 10 A.M. on the 29th—i.e. 42 hours after the poison had been swallowed—it was found that the trunk and limbs were partially stiff, that she was unconscious, and that there was no reaction to stimuli. The double heart sound could be heard over the sternum, the heart beating 30-40 a minute; signs of breathing and of a pulse were absent. Both pupils were markedly contracted. The skin and lips were deadly pale, but the cheeks were bluish (*leicht cyanotisch*). The stomach wash contained morphine; the urine drawn off from the bladder, besides albumin and casts, also contained a small quantity of morphine. Under active treatment for morphine poisoning the stiffness of the limbs began to pas off in two hours; consciousness began to be regained on the 30th. On Nov. 3rd the patient was convalescent and the urine free from albumin. No pneumonia or other complication supervened.

Mr. Spencer aptly quotes Marshall Hall's saying that "hibernation is, in every respect, but the parallel of ordinary sleep, varying only in force and duration."

NOCARDIASIS CUTIS RESEMBLING SPOROTRICHOSIS.

Dr. William H. Guy, of Pittsburgh, reports[1] a case which clinically resembled sporotrichosis, of which over 200 proved cases have been recorded since Schenk published his paper in 1898 on Refractory Subcutaneous Abscesses caused by a Fungus possibly related to the Sporotricha.

The patient was a coal-miner, aged 51, who presented a number of inflammatory nodules and indurated ulcers extending from the base of the left thumb to a point slightly above the bend of the elbow. On inoculation of various culture-media with the contents of one of the unbroken lesions several greyish-white pinhead-sized colonies appeared, which were found to consist of a mass of tangled threads bearing small granules. The organism was therefore identified with that which was originally isolated by Nocard from the superficial abscesses of cattle suffering from farcy. When first seen the patient was diagnosed as a case of sporotrichosis and was given a saturated solution of iodide of potassium. Apart from simple protective dressings, nothing else was done, and uninterrupted recovery took place.

A review of the recent literature on nocardiasis is appended, including the paper by Dr. J. B. Christopherson and Major R. G. Archibald in THE LANCET[2] on primary nocardiasis of the lacrymal gland.

VETERINARY SURGEON AS MEAT INSPECTOR.

THE want of a proper and uniform system of meat inspection in this country is being increasingly felt, while little is being done to select for the position of meat inspector the man most likely to be fitted for it—namely, the veterinary surgeon. His collegiate training includes both a special course and a special examination in meat inspection, and no one knows better the condition and appearance of the organs of animals in health and disease. The matter came before the largely attended representative meeting of the members of the Royal, Southern, and South-Eastern Counties Veterinary Medical Societies, held in London last week, when Mr. James Hayhurst, superintendent and veterinary inspector of the Metropolitan Cattle Market, Islington, read a paper on "The Duties of a Veterinary Meat Inspector," in which he particularly emphasised that in England only the larger towns had any pretence of meat inspection, and that in many places a butcher might, if he liked, offer for sale diseased or unsound meat with little risk of discovery. He drew attention, too, to the necessity for public abattoirs as against private slaughter-houses, and many other points in which Great Britain lags behind other countries in respect to the inspection of foodstuffs. At the termination of the discussion which followed Professor F. Hobday proposed the following resolution, which was carried unanimously, to be sent to heads of corporations and local authorities:—

That in the opinion of this meeting it is essential, for the protection of the public health, that a proper system of meat inspection be arranged; and that the veterinary surgeon, by virtue of his training in the diseases of animals and their flesh, was the best authority to be utilised for the purpose. Also that if public slaughter-houses were erected the cruelty to animals which sometimes occurred in private slaughter-houses would be prevented, and young children would be debarred from being within its precincts.

If the inspection of meat for human food is to be thorough and reliable it must be done by the scientifically trained man.

DOUBLING OF THE SPINAL CORD.

Dr. Benjamin Lipshutz[1] reports a rare variation in the anatomy of the spinal cord encountered during the regular laboratory work in the dissecting-rooms of the Daniel Brough Institute of Anatomy at the Jefferson Medical College. No clinical history of the case was available. The anomaly, which was found in the body of an adult male aged 35, consisted in a bifurcation of the spinal cord beginning at the twelfth thoracic vertebra and extending to the caudal limit of the spinal cord so as to form two independent symmetrical halves. The caudal limit of each half was at the level of the cephalic border of the first sacral vertebra. The conus medullaris of each half was independent, union taking place at the level of the third sacral vertebra into a single large filum terminale which was attached to the dorsal surface of the first segment of the coccyx. The cervical and thoracic portions of the cord were normal. Another anomaly was present in the form of an hour-glass shaped band of dura in the sagittal plane projecting between the two halves of the cord. There was also a number of small, flattened calcareous plaques adherent to the spinal arachnoid. Duplication of the spinal cord is a rare occurrence, only ten undoubted cases having been collected by Bruce, McDonald, and Pirie in 1905. The division usually occurs in the lumbar or lower thoracic segments of the cord. Other abnormalities, though absent in the present case, are frequently present, such as spina bifida, meningocele, and cutaneous or bony malformations.

MALARIA INVESTIGATIONS IN THE MALAY STATES.

SOME years ago a Malaria Bureau was established in the Federated Malay States, but its operations in the past seem to have been hindered by the inadequacy of its staff. It is locally admitted that the malariology of the country is very incomplete, but efforts are now in progress to make good this defect. Owing to the incompleteness of the available information it has been necessary hitherto to exercise great caution in accepting any generalised conclusions. From a recently published report by Dr. H. P. Hacker[2] we gather that efforts are at present being made to place the malariology of Malaya on a firm basis, and that now the main object of the work of the Malaria Bureau will be to collect full and accurate data concerning the disease and its various factors throughout the country. No general conclusions will be issued by the Bureau until they can be based upon an incontrovertible basis of facts. With a view to carry out the work we understand that the staff of workers is to be increased, and that from time to time reports will be issued giving details of the information as it is collected. These reports, Dr. Hacker believes, will become objects of reference and may assist other workers in arriving at a more uniform theory and practice of malaria prevention and treatment. In his

[1] Archives of Dermatology and Syphilology, August, 1920.
[2] THE LANCET, 1918, ii., 847.

[1] Archives of Neurology and Psychiatry, July, 1920.
[2] Federated Malay States, Malaria Bureau Reports, vol. i., November, 1919. By H. P. Hacker, M.D., B.Sc. Lond., medical entomologist, Federated Malay States. Singapore. Pp. 76. (Not on sale.)

recently published report Dr. Hacker calls attention to the insufficiency of our knowledge of the relative malaria-carrying properties of the various species of anophelines, and the conditions which control these properties. The pathogenicity, too, of jungle species of these mosquitoes is practically an untouched subject, and stands in urgent need of coördinated research. In the Malay States the most important carrier of the malaria infection seems to be *A. maculatus*, which is found usually in the hilly country; the less dangerous, *A. aconitus* and *A. fuliginosus*, are found in open swampy regions, and *A. umbrosus* in low-lying jungle. There are, of course, many other anophelines in Malaya, but these are among the species that have chiefly to be considered. The felling of jungle and the opening up of wooded ravines have been advocated by some authorities as an antimalaria measure. Experience, however, in the Malay States has shown that such operations require to be carried out with extreme caution. *A. maculatus* does not breed under the shade of secondary growth of vegetation or jungle, but as soon as a ravine is cleared *A. maculatus* appears and begins to breed rapidly, while the less dangerous jungle-frequenting mosquitoes disappear. If the opening up of hill jungle be necessary for the development of a place, Dr. Hacker insists that attempts should be made to keep ravines, which contain practically all the water and therefore all the breeding-places, under the original jungle and thus prevent the access of the dangerous *A. maculatus*. This is only one of the points touched upon by Dr. Hacker in his present report, there are also others of equal interest which can be usefully studied at first hand by those concerned with the problems of malaria. The proposed collection and publication of carefully verified data concerning the disease in the Federated Malay States is likely, in our opinion, to give valuable assistance in the solution of some of the still outstanding problems connected with malaria, a disease which impedes the economic development of many of our colonies and dependencies.

EYE-STRAIN IN KINEMAS.

IN response to an inquiry from the London County Council as to the possible causes of eye-strain in kinemas and the best means of removing them the committee of the Illuminating Engineering Society has now issued an interim report [1] which has behind it the authority not only of that society but also of the Council of British Ophthalmologists and of the Physiological Society, both of which bodies were represented on the committee. The point chiefly dealt with in this interim report is the proximity of seats to the screens. Experience shows that discomfort arises largely through effort involved in raising the eyes to observe pictures presented at an unduly high level, and the recommendation is made that the angle of elevation measured to the top of the picture should not exceed 35°. The kinema headache would appear to have this much in common with the "Academy headache," that both are related to fatigue of the elevator muscles of the eye. A limit to the lateral angle of view of 25° is also recommended. Another definite recommendation is that the illumination of the auditorium, which should be nowhere less than one-fortieth of a foot candle, should gradually be increased from the front to the back of the auditorium. A still more important point is that a definite rule should be enforced that no unscreened source of light should be visible to the observer from any seat in the theatre while looking towards the picture. Other matters touched on but left to be dealt with more fully in future reports are the different varieties of "flicker," film, and mechanical defects, and a possible standard of minimum brightness for the screen. The only reservation made by any members of the committee is by those representing the kinema industry, who draw attention to the absence of evidence of serious injury by eye-strain, and are of opinion that where the recommendation concerning seating would entail serious financial hardship there is no justification for the imposition of the rule recommended. Our own opinion is that here is a matter in which the interests of the public, although not vital, are yet of sufficient importance to justify State or municipal protection.

[1] The Illuminating Engineer, June, 1920.

SYPHILIS SIMULATING SYRINGOMYELIA.

Dr. Walther Blumenthal,[1] of Coblence, records the following instructive case. A lieutenant, aged 22, was exposed to infection in the beginning of September, and developed a chancre three weeks later, which cleared up under treatment with neosalvarsan. At the end of October he complained of both hands feeling dead. On examination dissociated sensory paralysis was found in both hands; in the right more than in the left, corresponding to a small isolated focus in the seventh cervical segment in the neighbourhood of the central canal. There was slight disturbance of tactile sensation in the first, second, and third fingers up to the middle line of the third finger, and perception of pain, heat, and cold was almost completely lost in these fingers. Examination of the rest of the nervous system, including the reflexes, cranial nerves, and fundi revealed nothing abnormal. Lumbar puncture was not performed. Although the initial lesion had appeared only five weeks previously and no secondary symptoms had yet developed the clinical picture suggested syphilis of the cervical cord. Energetic treatment with silver-salvarsan was instituted and the symptoms gradually subsided in the course of three months, during which other spinal-cord symptoms occurred—viz., slight inequality of the knee-jerks and abdominal reflexes—but soon disappeared.

[1] Deutsche medizinische Wochenschrift, August 12th, 1920.

THE METRIC SYSTEM IN THE BALANCE.

IN October, 1916, a Committee was appointed to consider and report upon the advisability or otherwise of the compulsory adoption of the Metric System of Weights and Measures in the United Kingdom. This Committee, presided over by Sir Joseph J. Thomson, was appointed by the Conjoint Board of Scientific Societies, and a report was first prepared in June, 1917; delay, however, ensued through fresh considerations arising, and the report has only now been published. The terms of reference were wide enough to remove the question out of the purely academic sphere and to make it necessary for the Committee to consider the effects in common life as well as in technical manufactures and industries. Briefly, its recommendations covering scientific ground in a wide sense amount to the following:—

That the British system of units of weights and measures be retained in general use in the United Kingdom.

That a definite movement towards compiling statistics in metric units should be set on foot. (This refers chiefly to maps and plans and contours, which, it is held, should be shown in metres and not in feet.)

That while it is not proposed to abolish such units as the mile, the yard, the foot, and the inch, distances should be expressed in miles and decimals of a mile, decimals of a foot, but not in any complex of miles and yards, feet, and inches; that railway charges should similarly be calculated in tons or in pounds, but not in hundredweights, quarters, and pounds, and so on.

That according to the above principle the pole, furlong, and league be abolished, as well as the square rod or perch and rood, all areas of land being measured in acres and decimals, or in square feet for small plots. Similarly, the abolition of the grain, dram, stone, quarter, and hundredweight of 112 pounds is recommended, and the complete abolition of apothecaries' weight.

That the use of the gallon as a general standard of capacity be retained, subdivided for retail use into quarts and pints; that the peck, bushel, quarter, chaldron, and barrel be abolished and measure by weight substituted.

That the use of the metric system be made compulsory with as little delay as possible in the whole trade in fine chemical and drugs, and in all specifications and prescriptions relating to such products.

That no change in the existing system of British coinage be attempted in present circumstances.

With few exceptions the report appears to have been considered favourably by the scientific societies and financial authorities, the former urging the use of the metric system in all scientific work and its introduction into industries, especially those of a complicated kind involving scientific and technical processes. That medicine has been singled out for special treatment by a non-medical committee of reference is a testimony to the

exactness of our discipline and to the open-mindedness of its votaries. The Council of the Royal Society of Medicine strongly endorses the proposal to adopt the metric system in connexion with medical science, and the Council of the Royal College of Surgeons expressed its approval of the recommendations. It will be seen that these recommendations do not bid for uniformity and, if adopted, would leave medicine still with a more or less mixed system of standards. But the use of the metric system in prescribing must result in its adoption for the weight and dimensions of the human body; and the rest would soon follow. It is significant that the chairman, Sir J. J. Thomson, has not signed the report, nor have M. le Duc de Broglie and Mr. Charles P. Sparks. The signatories are Mr. H. Wilson Fox, M.P.; Sir Robert Hadfield, F.R.S.; Mr. A. R. Hinks, F.R.S. (secretary); Sir Philip Magnus, M.P.; the late Professor J. Perry, F.R.S.; Professor W. Cawthorne Unwin, M.Inst.C.E., F.R.S.; and Professor W. W. Watts, F.R.S., secretary to the Conjoint Board of Scientific Societies.

A MILITARY M.O.H. GROUP.

WITHIN the Society of Medical Officers of Health a group is being formed by those members who are specially interested in naval, military, and air-force hygiene. Its formation has the approval and support of the official heads of the medical departments of the Navy, Army, and Air Force. The group will be drawn from the three Services and from their auxiliary forces, membership being confined to medical men who hold, or who have held, sanitary appointments in any of these Services and to those who are in the possession of a diploma in sanitary science, public health, or State medicine. The object of the group is to provide an opportunity for present and past officers of the Services to meet and discuss papers dealing with subjects of common interest as well as to make more close the liaison between officers in the Services and medical men carrying out similar work under civil conditions. Nothing but good can come of such free and informal exchange of views between those who have seen hygienic practice under all manner of conditions, and the deliberations of the group will be watched with attention by those officially responsible for public health. All medical men eligible for membership are invited to communicate with Major W. N. W. Kennedy, O.B.E., Town Hall, Croydon, acting honorary secretary. The subscription to the society, including membership of the group, is £1 1*s*. per annum, which entitles members to receive a copy of *Public Health* each month. The first meeting of the group will be held on Friday, Sept. 24th, at 4.15 P.M., when officers will be appointed, and Brigadier-General W. W. O. Beveridge, director of hygiene at the War Office, will read a paper on Disinfection in the Field.

ATTENTION is directed to the notice in our news columns of a course of post-graduate study for general practitioners at St. Andrews, under the direction of Sir James Mackenzie.

THE constitution of the War Office Departmental Committee to inquire into the expert knowledge derived from the experiences of the late war in regard to shell shock, over which, as we announced last week, Lord Southborough presides, is as follows, the departments which each member represents being added in parentheses: Temporary Surgeon-Lieutenant Thomas Beaton (Admiralty), Dr. J. L. Birley (Air Ministry), Dr. H. J. Bond (Board of Control), Dr. Maurice Craig (Ministry of Pensions), Wing-Commander M. W. Flack or Wing-Commander J. McIntyre (Air Ministry), Dr. H. W. Kaye (Ministry of Pensions), Dr. Hamilton C. Marr (Board of Control for Scotland), Surgeon-Commander E. T. Meagher (Admiralty), Brigadier-General J. G. S. Mellor, Sir Frederick W. Mott, F.R.S., Major A. D. Stirling and Dr. W. Aldren Turner (Army Medical Department), Mr. Stephen Walsh, M.P., Major W. Waring, M.P., with Major W. R. Galwey (secretary).

PUBLIC HEALTH IN SOVIET RUSSIA.

BY L. HADEN GUEST, *M.C.*, M.R.C.S. ENG., L.C.C.
SECRETARY AND PHYSICIAN TO THE BRITISH LABOUR DELEGATION.

II.—THE MEDICAL SERVICES.

THE work of dealing with epidemic diseases in Russia has been carried out by a nationalisation and centralisation of all public health and medical work. The Commissariat of Public Health came into existence at the end of 1917, and controls the services of the army and navy, as well as that for the civilian population. The work of the department is divided into (1) medical and (2) sanitary, (3) a temporary anti-epidemical service. All medical services of any kind whatsoever come under the control of the Commissariat. In theory all medical and dental attendance is free, and in practice free treatment, in so far as it is available with the limited resources at the Soviet Government's disposal, is "accessible" to all free of charge. In fact, alongside of this free system the old system of private practice continues, although only some 10 or 20 doctors in Petrograd are not in the service of the Soviet Government. In Petrograd the acceptance of fees is severely frowned upon, and I heard of a physician in State employ being prosecuted by the Tribunal of the Peoples' Justice for demanding a fee of 1000 roubles, nominally £100. In our money 1000 roubles is roughly equivalent to 2*s*. at present rate of exchange, and will purchase in the open market 2½ lb. of bread, about eight eggs, or about a quarter of a pound of butter. In other towns the taking of fees seems to be regarded less severely. As far as I could gather all hospital or institutional treatment was free in fact.

Owing to the shortage of doctors it is usual for three, four, or more separate appointments to be held at the same time, and the doctor holding them receives a salary for each appointment. A usual monthly salary is 4000 roubles per appointment. The number of doctors in Petrograd, including army doctors, was 1300, about half of whom were women. Doctors are paid salary on a scale varying with (1) length of service, (2) specialist qualifications. Doctors also usually have rooms provided, and very frequently their meals provided also. I was told that sometimes doctors receive not only the salary for each separate appointment held in money, but also the rations for each separate appointment in kind. One doctor told me that extra bread came in useful for paying cab fares. There are a few droshkies still available in the streets; the fare for a short distance in Moscow, for instance, being 2000 or 3000 roubles. But the "isvostchniks" (drivers) prefer to be paid in kind. Small tablets of soap are a useful kind of small change to carry about.

Organisation in Petrograd.

The organisation in Petrograd consists of a central town public health service under the control of the Petrograd Health Department, who are all Communists. At the head of this is Dr. Pervouchen, who was careful to explain to me that he held his appointment, not as a doctor, but as a Communist and a representative of the workers. Under this central department are the ten districts (rayons) into which the town is divided, each district having its own health department. Sick persons able to attend as out-patients go for medical treatment to one of the town clinics, and if they do not know where to apply can get information at the district headquarters of the health department. Those needing to be visited at home send a message to the district headquarters and a doctor calls at the house. I was told that all cases requiring hospital treatment are transferred to hospital by the ambulance service under the control of the town.

I personally inspected a parade of this ambulance service, which was under the command of Dr. Haffkine (nephew of Dr. Waldemar Haffkine). The organisation was military, and the personnel consisted largely of medical students. It has been created by the Bolsheviks. This transport service, however, discharges several different functions, and provides

(*a*) first aid by doctors in case of accident and emergency; (*b*) transport of cases to hospital; (*c*) transport of infectious cases to hospital, and disinfection and repair in the homes of infectious cases removed to hospital. I saw myself a large number of motor ambulances and horse ambulances and one steam tram ambulance, as well as closed wagons for transport of clothing and bedding for disinfection. At the special parade which took place in the grounds of a large hospital the personnel of the corps gave a display of stretcher drill in which they were quite reasonably proficient. Mistakes and awkwardnesses were apparent, but were of exactly the same nature as those made by any ordinary field ambulance on nervous occasions. The clothing of the personnel of the corps was good, close fitting coats and breeches of leather for the majority and good boots. The heavy losses from infection suffered by doctors and sanitary personnel have made the authorities very careful of the lives of those doing this dangerous work. Doctors engaged in infectious diseases work are paid 80 per cent. more than others, and get rations on "Red Army" or highest scale. Nevertheless, 50 per cent. of doctors so employed have died from typhus and other infections. The statistics regarding number of persons employed on this first-aid and transport service in Petrograd I give as they were stated to me by Dr. Pervouchen: Doctors, 40; sanitary instructors (medical students), 36; motor ambulances and motor-cars, 104; horse vehicles (expropriated private broughams are used as well as ambulances), 189; trams, 10; steam tram, 1; sanitary wagons, 5. The cars, wagons, &c., I saw were in workmanlike condition. The horses were in reasonably good condition. The total number of personnel engaged in disinfection duties was given as 1017, which included 360 trained sanitary men to carry out disinfection and subsequently repair any damage done. This insistence on repair of damage was for the purpose of cultivating good feeling and so facilitating disinfection.

Hospitals: A New Institute of Radiology and Rontgenology.

During the height of the typhus epidemic last winter many temporary hospitals were opened for treatment of this disease. Many ordinary hospitals (about 100), however, had to be closed on account of absence of coal and wood for heating, and consequent breakdown of

FIG. 1.—The new Institute of Radiology and Rontgenology in Petrograd.

water and sanitary arrangements. As, however, the population has decreased from 2,500,000 to about 1,000,000 (probably 800,000), the decrease matters less than it would have done formerly.

A new Institute of Radiology and Rontgenology (see Figs. 1 and 2) has been erected under the medical control of Dr. Nemenoff, President of the Institute. This institution combines a hospital with a scientific research department, and is publishing some of its results at present. I saw these research laboratories as well as the wards, and the work was going on quite satisfactorily except for the lack of Coolidge tubes. A special factory for repairing and remounting of X ray tubes has been erected in Petrograd in connexion with the Institute. I was told—by a junior house surgeon speaking English and French—that whereas the discipline in the hospitals at the beginning of the Revolution was very bad, it was now "like old times."

The only other medical institutions I saw in Petrograd were a clinic for the study of defective children, in which they were specialising in rather elaborate studies of mental defect, and a "first-aid" hospital for emergency cases. All three of these were far above

FIG. 2.—The monument to Rontgen in the forecourt of the Institute. The names on the plinth are. W. C. Rontgen, C. G. Barkla, W. H. and W. L. Bragg, M. Laue, A. Sommerfeld, H. G. J. Moseley, P. Debye, M. Sklodowsky-Curie, H. Curie, H. Becquerel, E. Rutherford, W. Ramsay, W. Crookes, J. J. Thomson, P. Lenard, H. A. Lorentz, C. T. R. Wilson, Milikan, M. Planck, N. Bohr.

the average level of Russian hospitals, but I did not have an opportunity of seeing a normal hospital in Petrograd owing to the necessity for attending a tremendous military and naval review got up in honour of the Labour Delegation. The mortality of children in hospital (up to 12 years) was given as 24 per cent. The birth-rate was said to be rising rapidly. The figures of 40,000 births per annum were given for the pre-war Petrograd of 2,500,000 people, and a present number of 20,000 to 25,000 births per annum for the present Petrograd of about 1,000,000.

Arrangements in Moscow.

In Moscow the medical arrangements were rather different. Free treatment was available, but fees appeared to be paid pretty openly to doctors and dentists. And all institutions were centralised and not arranged in districts, nor was there apparently a district health organisation in addition to the central town organisation. A hospital at the Kremlin, where the chief Government offices are, was well equipped with medicines, but the resident doctors were only partly qualified. The arrangements were otherwise passable. Two town hospitals inspected were badly arranged, badly disciplined, and, in the typhus block, dangerously dirty, no disinfection and little washing having been attempted. These two hospitals were indicated to me by non-official persons as "normal" samples of Russian institutions. The beds were largely without linen and mattresses and the very poor blankets provided were dirty and insufficient. The surgical wards, however, were very much better than the medical. The doctors looked ill, half-starved, and terribly depressed. An

eminent physician I met could not be induced to believe that England might lift the blockade and allow medical and other supplies to come through. He was a very sad, unsmiling, and bowed man. Other medical institutions seen in Moscow were much better, the special clinics lately established being on more modern lines.

Medical Service in Country Districts.

In addition to Petrograd and Moscow, I saw hospitals at Saratoff on the Volga and at Beresnaki on the Volga. The standard was not high, but it was adequate. A great effort against the odds of tremendous difficulties is being made in Russia to keep the medical service going and to improve it. Their difficulties, apart from lack of soap and medicines, lie in the failure of the supply of doctors, which has led to the temporary employment of partly qualified people for appointments needing fully qualified men or women. The medical faculties at the universities are working, but not well, and it will be some time before Russia has all the doctors she requires. The conclusion of peace will render the army doctors available, but even their services will not fill up the gap that has been made by death, war, and revolution.

The classification of medical institutions in Russia is given in the following list, which represents, however, rather the ideal than the achieved (no Russian statistics can be accepted without serious reservations):—

(1) General clinics for areas with a population of 2000 to 3000 persons.

(2) Special clinics for eye diseases, skin diseases, venereal diseases, &c.

(3) First-aid institutions.

(4) Night-duty medical service.

(5) Visiting medical service.

(6) (*a*) General hospitals for regions; (*b*) special hospitals (obstetric, ophthalmic, &c.) which serve whole towns and their surrounding villages.

The total number of hospitals in the republic is given as 10,000, with about 270,000 beds, 17,000 doctors, 35,000 medical assistants, and 120,000 junior medical staff. Medical arrangements for the country aim at making medical assistance available for all at a maximum distance of five versts. In pre-revolutionary Russia the distance was often 20. Progress has already been made in the direction desired, notably in the Poltava government.

The nationalisation of medical service has, of course, extended to health resorts, the places available for treatment being usually allotted by the Central Commissariat of Health, except in the case of institutions of purely local importance. During 1919, 5000 patients were so treated, and they were no longer the old-time patrons weighted with over-generous living. The distribution of patients at Lipetz in the Tambov government is given as Workers and Soviet officials, 70 per cent.; Red Army, 25 per cent.; other citizens, 5 per cent. Board, residence, and treatment are all free at these institutions.

(*To be continued.*)

HOUSING NOTES.

The Labour Housing Association.

THE Labour view on the shortage of houses was ventilated at Portsmouth on Sept. 4th, when the Labour Housing Association held its annual meeting. Much of Mr. Thomas's speech might have been uttered on behalf of the Ministry of Health; as when he pointed to the influence of bad housing on political unrest or advocated increased transport facilities to combat overcrowding. But the resolution condemning the Government had no constructive suggestion and criticisms of the Ministry's housing standards carried no particular weight. Some interesting figures were given by Mr. George Hicks, secretary of the Bricklayers' Union, who announced that out of 54,000 bricklayers only 7000 are engaged in house construction, while of all building trade operatives less than 10 per cent. are so occupied as compared with 40 per cent. before the war. This is an intolerable state of things.

Building in Concrete.

Among the methods favoured by the Ministry of Health for the reduction of the cost of building is the use of alternative materials of construction to the orthodox brick and mortar. Amongst the various substitutes hollow concrete blocks are, perhaps, the favourite. A bungalow built on the Clifton-Ewart system has just been put up at Nottingham. The chimney stacks are of brick, but in later models these will, no doubt, be replaced. The rest of the skeleton is composed entirely of concrete blocks. No wood has been used except for doors and windows. The bungalow, which was built in three weeks and could by intensive work have been completed easily in half the time, contains four good-sized rooms, bathroom, and lavatory, and when the subsidy has been deducted the cost will be £300. No doubt such bungalows could be built more cheaply, as, for example, by the employment of unskilled labour. But it is premised that any attempt to cheapen housing construction will be rendered void by the interest vested in the brick. Every builder is dependent on the good-will associated with the brick, for though he might build his walls with non-union labour he would be unable to find plumbers, carpenters, or electricians to complete the work. So it comes about no one can afford either to use bricks or to do without them. In the meantime, the unskilled man remains unemployed and his children are crowded ever more and more into the insatiable slums.

Standards of Accommodation in Herefordshire.

Some time ago the Ministry of Health suggested to medical officers that the housing section of their annual reports should be issued as a separate document. Among others Dr. Herbert Jones, M.O.H. for Herefordshire Combined District, has complied,[1] and a comprehensive survey of present housing conditions is the result. In half of the parishes more houses are needed, and the schemes submitted to the Government, even were they completed at the present day, would not meet this need. As regards the standard of accommodation, Dr. Jones would have each house built on a quarter-acre plot and to contain parlour, kitchen, washhouse, scullery, bath, and three bedrooms. By discussing the question at "women's institutes" and other organisations he has discovered a unanimous opinion in favour of both parlour and bath. The latter is wanted even where water cannot be laid on, the women being more anxious that the bath should be easily emptied than that it should be easily filled. He adds that there are old-age pensioners occupying houses larger than they need, and hints that if convenient houses—presumably with less than three bedrooms—were provided for these their present dwellings would become available to larger families.

A Tragedy at Wandsworth: No Room for the Baby.

An occasional incident of human interest serves sometimes to bring home the importance of impersonal political movements. Such an incident was provided at a London police-court, when a man was recently charged with aiding and abetting his wife, aged 28, to kill herself. The woman died, it was said, as the result of an illegal operation, and the evidence showed that her wish to avoid the birth of a child was due to her inability to find a house which would provide it with a decent home. We agree with the magistrate that a full realisation of the price which our fellow citizens are paying in suffering and disease would help considerably those who are now negotiating to find some speedier way of settling their differences and of proceeding with the rapid delivery of houses.

[1] Annual Report, 1919, issued August 20th, 1920.

SCARLET FEVER IN MANCHESTER.—Seventy-five cases of scarlet fever were reported in Manchester last week, as against an average of 60 during the six preceding weeks. There are four cases of small-pox in the Clayton Hospital, but no new cases have been notified in Manchester during the past fortnight.

HYGIENE ON THE SEA:

ACCOMMODATION FOR SEAMEN IN SHIPS OF TO-DAY.

(BY OUR SPECIAL CORRESPONDENT.)

I. THE "AQUITANIA."

THE *Aquitania*, of 45,647 tons gross (this is her sea-going loaded weight), with the black tops of her four red funnels soaring to the skies, looked huge as one approached her in the docks at Southampton. And a big ship she is—over 300 yards long, with 97-ft. beam, and a load-draught of water of 35 feet. She is fast, too, for her oil-driven turbine engines, with their 56,000 horse-power and their four screws, give her a speed of 23 knots, or 26 land miles per hour. When the Cunard Company was good enough to send me on board she was in the usual turmoil of a ship the day before going to sea, when all kinds of stores are coming on board, strangers are flocking to and fro on business, and, in spite of these strangers and the dirt they are bringing on board, every endeavour is being made to get the ship thoroughly cleaned. At such a time, seeing she is alongside a wharf with big sheds that keep the wind off her, a ship is so hot that one feels she should be taken out into the stream and anchored for a night to get aired and cool before her passengers arrive; but that is a counsel of perfection. They are many, these passengers, 750 first-, 900 second-, and some 2000 third-class, and with her officers and crew her captain has the responsibility at sea for the lives of some 4000 souls.

Comfortable Accommodation for Passengers.

The company is doing what it can to make them all as comfortable as they can afford to be. There are suites for millionaires with sitting-rooms and bedrooms, smaller cabins for the less wealthy, all in the first-class section having fixed basins and hot and cold water laid on. In the third-class there are folding wash-stands and the furniture is less magnificent, but the beds are good. For the first-class passenger there is a beautiful saloon, a grill-room, too, a magnificent smoking-room, lounges, a swimming bath, and a gymnasium. The second-class saloon is very bright and comfortable. These saloons have chairs, and that shows the company has confidence that the steadiness of the ship and the deep pile of the carpets make it certain that in no weather is there fear that the rolling of the ship will seriously incommode the passengers. Not till we come to the third saloon do we find the fixed pedestal, rotating seats that we all know at sea. There are pianos for every class of passenger.

The medical officer on duty received me, but as he was for the moment busy I was taken round the ship by the dispenser, formerly a chief sick-berth steward in the Royal Navy, and under his capable guidance I saw how the practice of hygiene is improving at sea. There are three hospitals in this great ship, and in each 12 beds. One hospital for men, with the dispensary and operating-room adjacent, and another for women; a third, distant and well isolated, is for infectious diseases. Besides the dispenser and his mate, there are two female nurses on the staff.

The System of Ventilation.

The ship is, of course, artificially ventilated. In fine or moderate weather the numerous side ports are open. There are some in dangerous positions which are fitted with Utley's patent water-excluding side lights, which permit ventilation in all weathers. But never can enough air for so many people pass naturally in and out of so large a ship. Accordingly there are everywhere between decks, in cabins, saloons, and lobbies, in bath-rooms and water-closets, trunks or conduits for forced ventilation, carrying in fresh air or exhausting the foul. And as cold air might chill the inhabitants and cause complaints there are fitted in the ship 36 thermo-tanks, which heat the air before it is introduced into the ship. The ventilation of a ship is a complicated problem, and it is said on board that the currents in a ship cannot always be made with advantage to run constantly in the same direction; accordingly these thermo-tanks and their fans are fitted so that they may be driven either direct or reversed; that they may be used alternatively as supply or exhaust ventilators. This is, I think, to be regretted. Trunks are hard to clean, and an exhaust trunk is apt to accumulate some dust, and when the current is reversed some of that old dust is carried out. An epidemic of sore-throat has been attributed to this cause. Generally fresh air is supplied to cabins and passages, while lavatories, &c., have exhausts. Water-closets are in such a ship so high above the water that shore patterns are used, with a strong flush from a sanitary tank of sea water.

The Crew's Quarters.

But readers of THE LANCET will specially desire to know what improvements there are nowadays in the accommodation of the crew. The *Aquitania*, a hospital ship in the war, has since the war been completely refitted, and advantage has been taken of this opportunity to remodel all the berthing arrangements of the crew. Certainly they are very different from those the writer remembers in the *Campania* of the same line, when she was the greyhound of the Atlantic. The stewards are berthed amidships, the seamen and firemen forward. Most of the stewards live in large dormitories with double-tiered iron beds all round, while the seniors have one, two, or three berthed cabins. The seamen and firemen have small cabins each holding three or four men; and what different places they are from the old forecastle! I estimated one of these cabins, for two men, as 9 ft. high, 9 ft. long, and 8 ft. wide, 728 cub. ft., giving each man, not the 120 cub. ft. required by the law, but 300 cub. ft. of air space, and there was besides an air trunk and a 10-in. side port. 120 ft., be it remembered, is all that the Merchant Shipping Act requires. The rest is supererogation. There was in this cabin an exposed iron beam; that it had no insulating cork-paint made me anxious, but I was assured that the ship was kept so warm by steam-radiators that even a naked iron beam like this did not sweat. There was a little cabin, also a mess place, for the four boys who do duty on the bridge, and if only boys could go on always serving in the *Aquitania* there would be little hardship in a seafaring life beyond the weather. There are large mess decks for the seamen and firemen, well warmed and well lighted, with tables for their food and benches to sit on. Not least of the benefits is it that the men do not have to prepare their dinners, nor do they get them cooked by an inferior cook, for all their food is drawn from the ship's galley where the large staff of cooks prepares food daily for some 4000 people. Compare all this with accounts of the merchant seaman's lot even 10 years ago!

Stewards and their Meals.

But I saw no mess places for the stewards. In the *Campania* 15 years ago many of the stewards and stewardesses sat down to meals in the saloon after the passengers had finished, and it was a pleasure to see them comfortable. Consequently, I was disappointed to find that in the *Aquitania* the company have gone back to the evil custom of giving the stewards good food, indeed, but no table at which to eat it. It always pains me when I am travelling by sea to observe the stewards standing up to their meals at the pantry counters; not only the position but the oppressive heat must tend to wear them out and prevent the companies from getting their best service. I am sure that with a little consideration the company can better this hardship, which is far from inevitable.

The *Aquitania* no longer burns coal, only oil. That also makes for the comfort of the crew. I noticed there seemed few baths for firemen, and asking a fireman who was by if there were others, he told me baths were less necessary now, the work was so clean; indeed, it was unnecessary to change your clothes at the end of a watch in an oil-fired stokehold. Oil has enormously improved the comfort and status of the

fireman. By lessening his numbers it has made room in the ship for allotting greater space to the crew individually, and for increasing their comfort, as I have said.

My thanks are due to the company, and to the various officers of the ship, who, themselves very busy, yet made a little time to show me everything, and to answer courteously all my many questions.

UNEMPLOYMENT INSURANCE

IN RELATION TO NATIONAL HEALTH.

THE Unemployment Insurance Act, 1920, has received the Royal assent, and will come into operation on Nov. 8th. Public attention has been so much occupied with foreign politics and with domestic problems of more immediate interest, or making more insistent claims for consideration, that the passage of a measure affecting a vast number of employers and employed persons will perhaps only be realised by many of these when they find themselves called on to pay their contributions under it. Many such will have forgotten that the National Insurance Act, 1911, not only introduced a compulsory system of health insurance, but also provided, more or less experimentally, for compulsory insurance against the ill-effects of unemployment in certain scheduled trades. Presumably the experiment has been found to be successful, for the new Act extends compulsory insurance to substantially all persons for whom health insurance contributions have now to be paid.

Persons Exempted from the Act.—Employers' Contributions.

Outworkers, agricultural workers, and persons in private domestic service are exempted from its operation, as are also certain classes of employed persons whose rights and conditions of employment render such insurance unnecessary in their case. These, however, are for the most part persons excepted from the operation of the Health Insurance Acts. Under the Unemployment Insurance Act workers over 70 year of age will be insurable, except in the case of old-age pensioners, who are excluded both as regards contributions and benefits. Even with the exceptions enumerated above it is estimated that about 8,000,000 persons will for the first time become insured against employment, making up the total of those so provided for to 12,000,000. Clerks and other non-manual workers will note that they are included if their remuneration does not exceed in value £250 per annum.

The contributions of employers will range from 4*d.* per week for men over 18 years of age to 2*d.* for girls between 16 and 18, and the employee will contribute from 4*d.* to 1½*d.* according to age and sex, payment being made by special stamps in the manner with which health insurance has made all familiar. Benefits will be 15*s.* per week for men, 12*s.* per week for women, and half the full rate for contributors under 18 years of age. The Act provides further for certain returns of contributions at the age of 60, and for the substitution of special schemes giving equal or superior advantages with the approval of the Minister of Labour.

Interdependence of Health and Unemployment Insurance.

Outwardly the connexion between health insurance and unemployment insurance is not close, and when the original Act of 1911 was passed many objected to the inclusion of two subjects apparently disconnected and both of great national importance in one measure. Both health insurance and unemployment insurance, however, have as their object, or as one of the objects for which they have been brought into being, the provision of a means of existence for workers who from temporary, if disconnected, causes are unable to earn their living, and for those dependent upon them. If we consider the matter from this point of view we see at once that there is a hardship affecting an unemployed worker when he finds himself deprived of the means of buying bread for his children through no fault of his own, and when he sees a neighbour equally with himself deprived of wages, equally with himself not responsible for his plight, saved by a provision of the Legislature, at any rate, from the urgent pressure of hunger. There is also the more important consideration of the inexpediency, from a national point of view, of allowing the worker, his wife, and his children to deteriorate physically during those periods of enforced idleness which appear to be inseparable from industrial employment. The maintenance of the nation's health is one of the first, if not the first, duty of those who govern it, and is a duty receiving year by year a fuller measure of recognition. Under the Insurance Acts it will be the joint care of the recently constituted Ministry of Health and Ministry of Labour, the latter contributing its share by attending to the case of the wage-earner who is incapacitated as such though enjoying his full bodily health.

Sir John Simon's View.

Sir John Simon, then Solicitor-General, in an introduction contributed by him to Mr. Orme Clark's treatise on National Insurance, called attention to this interdependence of health and unemployment insurance, though not quite in the above sense, describing the inclusion of the two in a single Act of Parliament as due to an overwhelming reason of practical convenience. He pointed out that it was a necessary condition for receiving unemployment benefit that the unemployed person should be "capable of work," and that the condition for receiving sickness benefit was that the candidate for it should be "incapable of work." He evidently regarded it as likely that if one form of insurance came into being before the other there would be a temptation to make unjustified claims upon the fund first set up. It had been at one time proposed to make unemployment insurance antecedent to health insurance, but to have done this, Sir John Simon apprehended, would have made the man who lost work through ill-health find it to his advantage to declare himself sound, which is obviously undesirable. The two halves of the new scheme of insurance, he therefore submitted, ought to work side by side, the sharp distinction referred to between the conditions to which the different benefits attach being carefully drawn and maintained.

Practical Importance of the Combined Measures.

Looking back thus on the words written by a law officer of the Crown nine years ago we can safely infer that so far as the Government of that day was concerned the association of unemployment insurance with health insurance was designed and was recognised as of practical importance, and also that the extension of the former has only been delayed by the war. Having regard also to the fact that the present Prime Minister was mainly responsible for the introduction of national insurance in 1911, we look upon the Unemployment Insurance Act of 1920 as evidence of his satisfaction with the result of national insurance carried out upon the administrative lines which he laid down. The experiment of unemployment insurance has now been made on a comparatively small scale in the building, shipbuilding, and a few other trades. Experience on a far larger scale has been gained in health insurance, for the value set upon which in the public estimation the medical profession may regard itself as mainly responsible. Without public appreciation of the success of health insurance viewed as a whole it would hardly have been possible for any government to introduce another widespread measure of insurance, dependent for its funds upon a system of weekly contributions. We cannot forget that that system was at first chidden almost universally as irksome, unnecessary, and wasteful of time, but it now appears to be accepted as part of the nation's life on account of the results achieved. We look forward to similar acquiescence in the exactions, as at first they may be considered, of unemployment insurance, and to results in the maintenance of the public health, supplementary to and not less important than the results to be achieved by it in modifying and allaying social unrest.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Local Authorities and the Public Health.

THE deadlock which has arisen between many of the recently elected local authorities in Ireland and the Local Government Board is likely to cause serious interference with public health work. These authorities in which there is now a Republican majority—and they are very numerous—have, in the main, decided not to recognise the authority of the Local Government Board or to submit their minutes or books for the inspection of that body. The Government has replied by refusing to pay any grants to such recalcitrant bodies. Among the grants payable by the Treasury are half the cost of the tuberculosis service and three-fourths of the cost of the service for venereal diseases. It is likely that both these services will be seriously curtailed, if not completely stopped. It is understood that the Dublin Corporation has already decided to close its tuberculosis dispensary, hospital, and sanatorium, and it is probable that other authorities will have to follow its example. There are inconveniences in living in a country with two de facto governments, each ineffective, and neither recognising the other.

Abolition of Coroners' Inquests.

The *Dublin Gazette* last week contained a proclamation under the Restoration of Order in Ireland Act (1920), prohibiting the holding of coroners' inquests on dead bodies in ten counties of Ireland and in the county boroughs of Cork and Limerick. This step is said to be "for the purpose of securing the restoration and maintenance of order." Any inquests required to be held are to be held by a court of inquiry under the Army Act. It is to be regretted that the Lords Justices have considered it necessary to take this step. It is true that in many cases the coroners' courts, like the other courts of the King, have been unable to function. It has been impossible to find either jurors or witnesses. In this they are in the same case as the ordinary courts of assize. In some cases, too, juries have brought in verdicts which did not seem to be justified by the evidence. On the other hand, many juries have discharged their duties with courage and complete honesty, and their verdicts have a sanction in public opinion which a military court of inquiry cannot have. It must not be forgotten, too, that in many cases sudden death, calling for inquiry, has been due to military action, and the public is not likely in such cases to have much confidence in the impartiality of a military court.

Belfast Water-supply.

The Belfast Water Commissioners have decided to ask tenders for the construction of a great storage reservoir in the Silent Valley, a district high up amid the Mourne Mountains, and not far from the famous County Down golfing centre, Newcastle. Up to the present time they have had to depend on intermittent flows of water obtained from the Annalong and Kilkeel rivers in the Mourne range of mountains, supplemented by the enlargement of Lough Strannagh in the Kilkeel river catchment; but what is wanted for a big city like Belfast is a much larger and more regular daily flow of water all the year round to meet the growing demands for water by the citizens of Belfast and the inhabitants of the surrounding districts, and hence the immediate construction of a great storage reservoir right up in the Mourne Mountains, is what is now contemplated. This new reservoir, when completed, will have a storage capacity of 3000 million gallons and a tap-water area of over 250 acres, and it will by itself hold more water than all the existing reservoirs in the Woodburn and Stoneyford Belfast catchment areas at present in use. To many people the uselessness of constructing aqueducts from Belfast to the Mourne Mountains—a distance of over 20 miles—simply to tap a couple of rivers (the Annalong and Kilkeel) without any storage has been apparent, but now the making of a really large reservoir is to be begun.

Sept. 7th.

ROUMANIA.

(FROM OUR OWN CORRESPONDENT.)

Danger from Ice-creams.

AN important measure has been passed during 1920 dealing with ice-creams manufactured and offered for sale in Roumania. The ordinary method of making ice-cream as sold in the streets is to boil milk with or without the addition of some form of starch, together with a certain quantity of eggs, sugar, and flavouring. This mixture is allowed to cool naturally and afterwards is frozen. The cooling may take place under most unsavoury conditions, for instance, in a crowded living room, a disused (and unclean) outhouse, a confined and dirty back-yard, or even a scrap-heap; whilst, in addition, the surroundings among which the ingredients are mixed in some instances baffle description. Added to all this, the vendors and makers are generally Turks or Italians, whose ideas of cleanliness, whether personally or otherwise, differ materially from the here so much desired "western standard." Bearing these facts in mind it will readily be conceded that the ice-cream when sold may be contaminated in such a way as to be a danger to the consumer. To minimise this danger the board of hygiene have given orders for the control of the manufacture of ice-cream and other similar commodities. These must not be manufactured, sold, or stored in any cellar, shed, or room in which there is any inlet or opening to a drain, or which is used as a living- or sleeping-room. Special precautions must also be taken against infection or contamination of the ingredients used in the process of manufacture.

"Ptomaine" Poisoning from Meat.

A sharp outbreak of what would at one time have been labelled ptomaine poisoning occurring at Czernovitz in July has been carefully investigated, and the conclusions arrived at are of scientific interest. The outbreak, which affected 42 persons, of whom three died, was due to the *Bacillus enteritidis*, which gained entrance into pork sausages made on July 12th through the fæcal pollution of the meat. The meat was left in the chopping-house in open vessels, and was contaminated from the large intestines of pigs which were brought into and cleansed in the chopping-house while the chopped meat was waiting for the next process in connexion with its conversion into pork pies. The practical lessons to be learnt from this outbreak are (1) the necessity for absolute cleanliness in all branches of sausage preparation so as to prevent the meat becoming infected; (2) the desirability of baking or cooking the sausage before use so as to raise it to a temperature sufficient to cause the death of any bacteria with which it is liable to be contaminated. In connexion with these preventive measures it is obvious that sanitary authorities should have powers to make and enforce regulations in regard to the preparation of pork sausages and pies, as well as that of many articles of food, thereby guaranteeing the constant supervision of all processes incidental to such trades. In the Czernovitz cases the symptoms were rapid onset, shivering, giddiness, headache, vomiting and diarrhœa, drowsiness, and extreme prostration. The incubation period varied from a few hours to a few days, and the patients either died or had a protracted convalescence; seven of them recovered only after six to eight weeks' illness.

Dust and Smoke Prevention.

The Bucharest City Council for Sanitation recently held a special meeting on the question of the dust and smoke nuisance. They emphasised the importance of dust collection and removal, and the need for municipal cleanliness in its widest sense. Roads should be made of hard and practically impermeable paving in thickly populated districts, instead of with defective stone and ordinary wood blocks; hoses should be used on all courts and alleys and small streets; and damp dusters should be used both in private houses and in public institutions. The problem of smoke and its preventives was also discussed.

Bucharest, August 15th.

Public Health.

ANNUAL REPORT FOR 1919 OF THE MEDICAL OFFICER OF HEALTH FOR NORWICH.

Dr. H. Cooper Pattin in his report gives the estimated population of the city as 124,997, and the area in statute acres 7923. The birth-rate for 1919 was 16·35 per 1000, which was below that of the 96 great towns (19 per 1000). The gross recorded death-rate was the same as the average of the 96 great towns—13·8 per 1000. The infantile mortality-rate among legitimate children was 78·4, and for the illegitimate 166·7 per 1000 births—a striking contrast. The zymotic death-rate was 0·32 per 1000. The comparative mortality figure was rather lower than that of the country as a whole—928 as against 1000. There was only one death from enteric, and the cause of the enteric fever cases does not appear to have been either overcrowding or bad drainage. However, in 84 per cent. of the affected houses the food of the family was stored in an unventilated receptacle in the actual living-room, and 84 per cent. of the affected dwellings were within 20 yards of a sewer grating or gulley. 25 per cent. of the cases clearly recollected having consumed shell-fish prior to the attack. There were 140 notifications of phthisis and 79 of other forms of tubercle. 108 deaths were certified as due to pulmonary and 43 to other forms of tuberculosis, making a total of 151 deaths from tubercle, a figure much below the average of the last 25 years (221 deaths per annum). Dr. Pattin considers himself entitled to affirm that a diminution in the amount of tuberculous diseases is taking place. He says that he has long placed first in importance in the treatment of these diseases not houses, helpful as good houses are, but nutrition, and he confidently anticipates a further lessening of the amount of the disease among working people, proportionately with improvement in income, housing, and, above all, food. Other measures of great importance are the offer of gratuitous disinfection of all rooms in which a person has died from tuberculous disease, detailed instruction as to home treatment of affected persons, and the sorting out of tuberculous children. The Norwich City Council has appointed Dr. Theodore Fisher as tuberculosis officer, and only awaits the sanction of the Ministry of Health for the proposed site of their tuberculosis dispensary. It is also proposed to establish, in conjunction with the Norfolk County Council and the Borough of Yarmouth, a sanatorium and training farm at Stanninghall, near Norwich, where 700 acres, with farm buildings, and a farmhouse which makes quite a good administrative centre, have been procured and turned over to the joint committee by the Red Cross Society. A start has been made with a temporary pavilion accommodating eight males. An open-air school for children has also been inaugurated.

Housing conditions.—The total number of houses in the city is estimated to be nearly 30,000, and of these some 25,000 are occupied by the working classes. Compared with other large towns, the general character of the housing is fairly good, especially of the more modern dwellings, and there are many small gardens. Out of 5809 houses for the working classes inspected in 1919, 106 were overcrowded in respect of cubic space per head, and 458 had more than two persons per room. The health visitors paid 19,550 visits and revisits to houses, 5822 of them in connexion with medical inspection in the schools. They found in the dwellings visited 1801 sick persons. At their suggestion 95 houses and 238 persons were cleansed. The health visitors paid 2217 visits to the homes of the tuberculous, and found that 31·9 per cent. of affected persons had a separate bedroom, 14·1 per cent. had a separate bed in a double-bedded room, and no less than 54 per cent. shared a bed with another person. Dr. Pattin considers that about 4000 unfit houses will need to be replaced if a decent standard of comfort and accommodation is to be enforced. The council puts forward a scheme which has been approved by the Ministry of Health providing for the erection of 1200 new houses, and is making strenuous efforts to get these provided, but there are great difficulties owing to the cost and scarcity of trained labour and materials. It is hoped to procure the erection of 500 houses by the end of March, 1921.

School medical work.—11,674 children were inspected in the schools, and there were 453 re-examinations. 2498, including 589 cases of ringworm, were found to need treatment, and at the end of the year 2169 had received it. In some cases treatment was delayed by the advice of private doctors, and in others not undertaken; this was notably the case in dealing with adenoids and tonsils. At the dental clinic 4339 children were attended to. 1197 damaged permanent teeth were repaired with fillings, and 4165 teeth were extracted. One dental officer is not, however, considered sufficient to cope with the work amongst 19,000 children.

On the whole, Norwich may be considered a healthy city to dwell in, especially in comparison with other manufacturing towns.

"The chief occupations of such of its inhabitants as have to labour for their livelihood," says Dr. Pattin, "are boot-making, mustard and starch making, brewing beer, galvanising iron-wire, motor-engine and aeroplane construction; cocoa and aerated water production; banking; life, fire and accident insurance; teaching and preaching. The boot-making industry contributes a noticeable amount of phthisical cases, especially amongst the 'clickers'; I attribute this largely to the bad mechanical attitude imposed upon these workers—stooping with arms forward and chest cramped and retracted, and also to the apparent tendency of the less robust to drift into this branch of business."

The soil of the city is of a porous character, the higher levels being made up of glacial beds, through which the valleys have been excavated, exposing at their margins the crag formation and chalk, gravel, and alluvial deposits occupying the lower ground. The climate is relatively dry and bracing, and the rainfall low.

URBAN VITAL STATISTICS.

(Week ended Sept. 4th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·4, 9·9, and 9·9 in the three preceding weeks, rose to 10·0 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·7 per 1000, and coincided with that recorded in the previous week, while among the remaining towns the rates ranged from 4·2 in Gloucester, 4·8 in Gillingham and in Dudley, and 5·1 in Aberdare, to 15·4 in Ipswich and in Sunderland, 15·9 in South Shields, and 17·7 in Exeter. The principal epidemic diseases caused 255 deaths, which corresponded to an annual rate of 0·7 per 1000, and comprised 171 from infantile diarrhœa, 37 from diphtheria, 19 each from measles and whooping-cough, 8 from scarlet fever, and 1 from enteric fever. The deaths from infantile diarrhœa, which had increased from 87 to 150 in the four preceding weeks, further rose to 171, and included 34 in London, 20 in Hull, 10 in Liverpool, and 6 each in Sheffield and Sunderland. The mortality from the remaining diseases showed no marked excess in any of the large towns. There were 2402 cases of scarlet fever and 1404 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2266 and 1391 at the end of the preceding week. The causes of 30 of the 3427 deaths in the 96 towns were uncertified, of which 7 were registered in Birmingham.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 12·3, 10·8, and 11·1 in the three preceding weeks, declined to 9·8 per 1000. The 206 deaths in Glasgow corresponded to an annual rate of 9·7 per 1000, and included 6 from infantile diarrhœa, 4 from whooping-cough, and 1 from diphtheria. The 55 deaths in Edinburgh were equal to an annual rate of 8·4 per 1000, and included a fatal case each of diphtheria and infantile diarrhœa.

Irish Towns.—The 109 deaths in Dublin corresponded to an annual rate of 13·7, or 1·6 per 1000 below that recorded in the previous week, and included 3 from infantile diarrhœa. The 97 deaths in Belfast were equal to an annual rate of 12·2 per 1000, and included 8 from infantile diarrhœa and 1 each from enteric fever and scarlet fever.

VITAL STATISTICS OF LONDON DURING AUGUST, 1920.

IN the accompanying table will be found summarised statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious disease, it appears that the number of persons reported to be suffering from one or other of the ten diseases notified in the table was equal to an annual rate of 6·6 per 1000 of the population, estimated at

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING AUGUST, 1920.

(*Specially compiled for* THE LANCET.)

Cities and Boroughs.	Estimated civil population, 1919.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.									Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,358,309	—	1321	671	—	22	—	31	151	10	5	2211	6·6	—	6	8	56	15	3	105	193	0·6	3101	9·3
West Districts:																								
Paddington	143,938	—	30	12	—	—	—	—	5	—	—	47	4·3	—	1	—	1	1	—	—	3	0·3	70	6·3
Kensington	157,886	—	51	14	—	1	—	3	4	—	—	73	6·0	—	—	2	2	1	—	5	10	0·8	138	11·4
Hammersmith ...	130,981	—	42	25	—	—	—	2	1	1	1	72	7·2	—	—	1	3	—	—	1	5	0·5	73	7·3
Fulham	152,543	—	70	27	—	—	—	2	5	1	—	105	9·0	—	—	1	2	—	—	2	5	0·4	93	7·9
Chelsea	60,573	—	4	5	—	—	—	—	1	—	—	10	2·2	—	—	—	1	—	—	—	1	0·2	48	10·3
City of Westminst'r	127,533	—	11	10	—	2	—	2	4	—	—	29	3·0	—	1	—	—	—	—	—	1	0·1	67	6·8
North Districts:																								
St. Marylebone ...	97,953	—	30	1	—	3	—	—	3	—	—	37	4·9	—	1	—	—	—	—	1	2	0·3	72	9·6
Hampstead	88,012	—	6	8	—	—	—	—	5	—	—	19	2·8	—	—	—	—	—	—	1	1	0·1	43	6·4
St. Pancras	219,434	—	54	44	—	1	—	2	6	—	—	107	6·4	—	—	—	2	1	—	2	5	0·3	177	10·5
Islington	323,034	—	82	78	—	2	—	2	8	3	1	176	7·1	—	1	—	8	—	—	6	15	0·6	220	8·9
Stoke Newington...	50,954	—	14	11	—	—	—	1	1	—	—	27	6·9	—	—	—	1	—	—	1	2	0·5	47	12·0
Hackney	216,736	—	50	23	—	2	—	2	5	—	—	82	4·9	—	—	—	2	3	—	6	11	0·7	116	7·0
Central Districts:																								
Holborn	38,156	—	5	6	—	—	—	—	1	—	—	12	4·1	—	—	—	—	—	—	2	2	0·7	37	12·6
Finsbury	75,291	—	25	9	—	—	—	—	1	—	—	35	6·1	—	—	—	—	1	—	3	4	0·7	62	10·7
City of London ...	13,893	—	—	—	—	—	—	—	1	—	—	1	0·9	—	—	—	—	—	—	—	—	—	15	14·1
East Districts:																								
Shoreditch	98,134	—	35	17	—	—	—	—	3	—	1	56	7·4	—	—	—	1	—	—	8	9	1·2	103	13·7
Bethnal Green ...	110,085	—	71	41	—	—	—	2	11	1	1	127	15·0	—	—	2	5	—	—	1	8	0·9	66	7·8
Stepney	232,506	—	186	31	—	—	—	4	15	1	—	237	13·3	—	—	—	2	1	—	12	15	0·8	195	10·9
Poplar	153,644	—	102	57	—	2	—	—	6	1	—	168	14·3	—	—	1	4	3	1	6	15	1·3	141	12·0
South Districts:																								
Southwark	179,971	—	59	32	—	—	—	—	15	—	—	106	7·7	—	—	—	2	1	—	6	9	0·7	138	10·0
Bermondsey	124,239	—	74	14	—	1	—	1	4	—	—	94	9·9	—	—	—	2	—	—	4	6	0·6	98	10·3
Lambeth...	282,322	—	60	31	—	—	—	—	9	1	1	102	4·7	—	1	—	6	—	—	10	17	0·8	230	10·6
Battersea	159,316	—	35	21	—	—	—	1	5	—	—	62	5·1	—	1	—	—	—	—	6	7	0·6	115	9·4
Wandsworth... ...	333,693	—	60	55	—	3	—	3	4	—	—	125	4·9	—	—	—	4	2	1	6	13	0·5	198	7·7
Camberwell	273,802	—	66	42	—	1	—	—	8	—	—	117	5·6	—	—	—	5	—	1	4	10	0·5	183	8·7
Deptford...	111,205	—	26	19	—	—	—	—	7	—	—	52	6·1	—	—	—	—	1	—	3	4	0·5	90	10·5
Greenwich	98,484	—	24	9	—	2	—	—	4	—	—	39	5·2	—	—	—	—	—	—	1	1	0·1	66	8·7
Lewisham	167,754	—	31	15	—	1	—	2	1	—	—	50	3·9	—	—	1	2	—	—	3	6	0·5	116	9·0
Woolwich	136,237	—	18	14	—	1	—	2	8	1	—	44	4·2	—	—	—	1	—	—	5	6	0·6	84	8·0
Port of London ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

4,358,309 persons; in the three preceding months the rates had been 6·3, 6·0, and 6·5 per 1000. Among the metropolitan boroughs the lowest rates from these diseases last month were recorded in Paddington, Chelsea, the City of Westminster, Hampstead, Holborn, the City of London, Lewisham, and Woolwich; and the highest in Fulham, Bethnal Green, Stepney, Poplar, and Bermondsey. The prevalence of scarlet fever was somewhat greater than in the preceding month; this disease was proportionally most prevalent in Fulham, Bethnal Green, Stepney, Poplar, and Bermondsey. The Metropolitan Asylums Hospitals contained 2251 scarlet fever patients at the end of the month, against 1671, 1674, and 1940 at the end of the three preceding months; the weekly admissions averaged 335, against 228, 251, and 284 in the three preceding months. Diphtheria was slightly less prevalent than in the preceding month; the greatest prevalence of this disease was recorded in Hammersmith, St. Pancras, Islington, Stoke Newington, Bethnal Green, and Poplar. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1783, 1590, and 1470 at the end of the three preceding months, further fell to 1388 at the end of August; the weekly admissions averaged 173, against 214, 189, and 179 in the three preceding months. The prevalence of enteric fever was about half that in the preceding month; of the 22 cases notified during the four weeks ended August 28th, 3 belonged to St. Marylebone, 3 to Wandsworth, and 2 each to the City of Westminster, Islington, Hackney, Poplar, and Greenwich. There were 17 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 18, 19, and 24 at the end of the three preceding months; the weekly admissions averaged 3, against 3, 3, and 6 in the three preceding months. Erysipelas was proportionally most prevalent in Hampstead, the City of London, Bethnal Green, Stepney, Southwark, and Woolwich. The 31 cases of puerperal fever notified during the month included 4 in Stepney, 3 in Kensington, and 3 in Wandsworth. The 10 cases of cerebro-spinal meningitis included 3 in Islington; while the 5 cases of poliomyelitis belonged respectively to Hammersmith, Islington, Shoreditch, Bethnal Green, and Lambeth.

The mortality statistics in the table relate to the deaths of civilians actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the four weeks ended August 28th the deaths of 3101 London residents were registered, equal to an annual rate of 9·3 per 1000; in the three preceding months the rates had been 12·4, 10·3, and 9·6 per 1000. The death-rates ranged from 6·3 in Paddington, 6·4 in Hampstead, 6·8 in the City of Westminster, 7·0 in Hackney, and 7·3 in Hammersmith, to 11·4 in Kensington, 12·0 in Stoke Newington, 12·0 in Poplar, 12·6 in Holborn, 13·7 in Shoreditch, and 14·1 in the City of London. The 3101 deaths from all causes included 193 which were referred to the principal infectious diseases; of these, 6 resulted from measles, 8 from scarlet fever, 56 from diphtheria, 15 from whooping-cough, 3 from enteric fever, and 105 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded last month in the City of London. Among the metropolitan boroughs the lowest death-rates from these diseases were recorded in Paddington, Chelsea, the City of Westminster, St. Marylebone, Hampstead, St. Pancras, and Greenwich; and the highest in Kensington, Shoreditch, Bethnal Green, Stepney, Poplar, and Lambeth. The 6 deaths from measles were 44 below the average number in the corresponding period of the five preceding years. The 8 fatal cases of scarlet fever were 1 more than the average; of these 2 belonged to Kensington and 2 to Bethnal Green. The 56 deaths from diphtheria exceeded the average by 20; the greatest proportional mortality from this disease occurred in Hammersmith, Islington, Stoke Newington, Bethnal Green, Poplar, and Lambeth. The 15 fatal cases of whooping-cough were 14 fewer than the average; of these, 3 belonged to Hackney, 3 to Poplar, and 2 to Wandsworth. Three deaths from enteric fever were registered during the month, against an average of 6. The 105 fatal cases of infantile diarrhœa were 64 below the average; the greatest proportional mortality from this disease occurred in Holborn, Finsbury, Shoreditch, Stepney, Poplar, and Battersea. In conclusion, it may be stated that the aggregate mortality in London during August from these principal infectious diseases was 35 per cent. below the average in the corresponding period of the five preceding years.

Correspondence.

"Audi alteram partem."

DR. MARCEL BLOCH ON COAGULATION.

To the Editor of THE LANCET.

SIR.—In the French Supplement to THE LANCET of August 7th a paper appeared by Dr. Marcel Bloch on the coagulation of the blood, and you have already commented on the surgical interest of his work in your issue of August 21st. Dr. Bloch puts forward his views as to the part played by calcium in the blood in the phenomenon of coagulation, and advocates a method of measuring the coagulability of the blood, which I may for clearness resume very briefly. His method is based upon dilution and inactivation of the calcium in the blood by means of a solution of sodium citrate. To various tubes containing equal quantities of citrated blood increasing amounts of a solution of calcium chloride are added, and the tubes showing commencement and end of coagulation noted. By means of this method pathological variations of coagulability have been determined. As a result of these observations Dr. Bloch has formulated a theory of the coagulation of blood, the prime factor in the process being calcium salts. It is well known that calcium is essential for the clotting of blood, but it appears from Dr. Bloch's paper that too much importance is given to the part played by calcium salts without any real evidence to support this claim.

It may fairly be assumed, in the present state of our knowledge, that some of the calcium is combined with the proteins in the blood, but I can find no evidence to support the view that it is all in this form. Further, there is no real evidence of the way in which sodium citrate prevents coagulation, and certainly less of the actual dose required to prevent coagulation. In an investigation of the calcium metabolism in certain bone diseases it has been frequently observed that the blood coagulates very rapidly, even when three times the usual amount of sodium citrate is added. Again, it is a noteworthy feature that the blood in alcoholism clots very readily; and here, again, sodium citrate is unable to prevent it. This increased coagulability of the blood is naturally beneficial in such cases, but certainly deserves attention when the donor in a blood transfusion has partaken of alcohol previously—a not uncommon occurrence if opportunities are provided. It is in just such cases that sodium citrate probably assists rather than retards coagulation, a fact which may further explain its observed toxicity. That the results produced were in any way due to impurities in the sodium citrate was negatived by the use of absolutely pure sodium citrate.

The same effects have been observed, when potassium oxalate is substituted for sodium citrate. Thus in certain cases coagulation occurs whether the calcium salts have been non-ionised by citrate or precipitated by oxalate. The effects of alcohol on the complement-deviation test are familiar, and in this case we know that the action is a purely physical one, and it is suggested that the same change occurs in the blood of alcoholics, or in persons who have consumed alcohol just previous to the test. The physico-chemical basis of coagulation has much to recommend it since we are dealing with a colloidal solution and associated electrolytes, such as calcium. The activation of the electrolytes is by no means as simple a process as we are led to believe, but it would appear that changes in the reaction of the blood may play a not inconsiderable part. The changes may possibly be of small dimensions, hence the necessity of using the most delicate physico-chemical methods for their detection. This is the present objective.

The very interesting hypothesis put forward by Dr. Bloch may be true, but I for one require further proof before accepting it as the only explanation of this relation of calcium to coagulation. There is still a considerable amount of confusion due to the invention of a number of different names to various constituents taking part in the process of coagulation. It has the merit of simplicity, but all the recorded facts unfortunately do not fit in with such a view. It does not explain why certain blood samples coagulate even in excess of sodium citrate or potassium oxalate. Further, with experience of removal of blood for various analyses, it is well known that if too much citrate or oxalate is present the action of chemical coagulants is retarded and often incomplete. The action of non-ionised or inactivated calcium in such a medium is almost negligible, and leads one to suppose that the sodium citrate has a further action so far unexplained. The coagulation of the blood is of such importance as to warrant close attention, and further evidence along the lines already pursued by Dr. Bloch and others will be looked for eagerly.—I am, Sir, yours faithfully,

Sept. 6th, 1920. R. L. MACKENZIE WALLIS.

SMOKING AND OUTPUT: A SUGGESTION.

To the Editor of THE LANCET.

SIR,—In THE LANCET of July 17th you refer to the practice of permitting smoking in workshops, which seems to be gaining favour with employers. It is now stated that the practicability of permitting smoking in certain Royal dockyards is being considered by the Admiralty. Several maufacturing firms in Lancashire, especially in the Manchester area, have allowed their workmen to smoke during a certain period every day. After an experiment extending over several months the Vickers Metropolitan Co. have found that the permission to smoke for a short period daily under regulated conditions has increased the output, secured a more contented spirit among the men, and in general improved the efficiency of the workshops. Under conditions of strict prohibition it was found that the desire to smoke became so keen and overpowering that loitering in search of an opportunity for a surreptitious smoke was a common practice.

Another symptom of the clamour for official recognition of "smoking time" is the demand of students of the London County Council for permission to smoke at its evening classes. It is recorded that during the Great Plague in 1665 all the Eton boys were obliged to smoke in school every morning. During the war it was found that fatigue parties worked all the better, as did troops in training, when allowed a short time to rest and smoke. The effects on efficiency of a regulated well-timed smoking pause might well receive the attention of the Industrial Fatigue Research Board. If elusive entities of unknown chemical constitution, such as so-called vitamines or nutramines can exercise powerful effects on the human organism, there is much to be said for a thoroughly scientific investigation of the influence on the workers' daily "output" of the products of a drug of which at least some of the chemical constituents are known. A custom and solace, originally barbaric in origin, which has invaded all civilised countries and communities and is now practised by both sexes of humanity at practically all ages, must have some deep and far-reaching physiological and psychological significance.

I am, Sir, yours faithfully,

Manchester, August 30th, 1920. WM. STIRLING.

MIKULICZ'S DISEASE.

To the Editor of THE LANCET.

SIR,—The case of Mikulicz's disease reported by Dr. S. G. Askey in your issue of Sept. 4th reminds me that during the last four or five years I have seen three cases of the disease, all in white people, so that it is perhaps not so uncommon as might be supposed.

One case was that of a Greek lady about 60 years of age, whom I saw, in consultation with Dr. Alice Vance Knox of Highgate, some two or three years ago. There was a moderate painless enlargement of both parotids, and also of the submaxillary glands. Moreover, the parotids seemed at times to manifest some acute or subacute inflammatory

change, and when I saw the patient it was possible to squeeze a drop or two of thick clear mucus into the mouth from the unduly prominent orifice of Stenson's duct. But the symptom which was giving rise to most discomfort was the suppression of saliva. This, which, by the way, is not an invariable feature of the disease, was in her case absolute. Neither at meals nor at any other time was the patient's mouth even moistened with saliva, and the tongue, the lips, and the buccal surfaces of the cheeks were parched. As may readily be imagined, the discomfort resulting from the drying up of the secretion was very great. Salivary stimulants like sweets and acids only induced an aching or drawing sensation in the glands, and the patient had to be continually sipping water. In addition to the dryness of the mouth the conjunctivæ also were dry, for there was a complete absence of tears, so that when she had occasion to weep that act had to be effected without the usual overflow from the eyes.

A second case is one which I saw a few months ago in a middle-aged Scotsman. Fortunately for him the secretions had not dried up, but the parotid glands were both enlarged, and for several years he had been subject in an even more pronounced form than the first patient to periodical attacks of inflammation in the enlarged glands, lasting for about ten days and then gradually subsiding. When I saw him he had just reached the end of one of these exacerbations and muco-pus could be expressed from the duct. X ray examination of the glands and ducts, by Dr. Robert Knox, failed to reveal any calculus. From the gland secretion his own medical man, Dr. G. MacLellan Blair, of St. John's Wood, N.W., has had a vaccine made, and he reports that the patient is very much the better for it. Potass. iodid. is also being given.

The true nature of Mikulicz's disease is at present uncertain. The suggestion has been made that the enlargement of the glands may arise from a variety of causes. But while this may be admitted, nevertheless the participation of the lacrymal glands surely indicates that there must be some specific blood infection responsible for the changes. I am not aware whether the condition of the pancreas has been investigated. The disease is extremely chronic, and except for the objection felt by the patient to the fullness which the swellings impart to the face, and apart from such distressing symptoms as may be induced by the suppression of gland secretion, it does not seem to give rise to any serious phenomena.

I am, Sir, yours faithfully,

London, W., Sept. 4th, 1920. DAN MCKENZIE.

PS.—Since the above was written I have seen what looks like a fourth case of the same disease.

LEPROSY IN THE PHILIPPINES: A CORRECTION.

To the Editor of THE LANCET.

SIR,—In the annotation on Leprosy in India in THE LANCET of May 1st you record the impression given at the February Leper Conference in Calcutta that the segregation of lepers in the Philippine Islands has given as wonderful results as were claimed for Sweden, Germany, Norway, and Iceland. But you will note from the following table of our Philippine Health Service, certified by the acting director, that the annual admissions in our leper colony for the last 14 years and 5 months have fluctuated within relatively narrow limits and afford no sufficient evidence that segregation has solved our problem.

Lepers Admitted and Remaining in Culion Leper Colony, 1906 to 1920.

Year.	Admitted.	Remaining.	Year.	Admitted.	Remaining.
1906 (July–Dec.)	802	546	1914	859	3602
1907	690	780	1915	555	3680
1908	1603	1126	1916	966	4265
1909	1378	1726	1917	613	4485
1910	930	2172	1918	973	4692
1911	889	2511	1919	551	4706
1912	964	2991	1920 (Jan.–May)	225	4736
1913	795	3298			

I would like to invite your attention to a letter which I have recently addressed to Professor Milton J. Rosenau, of Harvard University, in connexion with a statement made in his book on "Preventive Medicine" regarding results of leper segregation in our islands. Rosenau admits that in the collections and segregations of lepers in Hawaii the results have been indifferent, and that there must be considered some factor as yet unrecognised in the control and prevention of leprosy.

The erroneous impression that we are on the high road to a solution of our leper question might, if uncorrected, lead to neglect of further researches along other lines. I am, Sir, yours faithfully,

JOSÉ ALBERT,
Professor of Pediatrics; Member, Council of Hygiene, Philippine Health Service.

Manila, July 20th, 1920.

The letter from Professor Albert to Professor Rosenau contains the following passages:—

I have taken the liberty to call your attention to what appears to be a misstatement in the last two editions of your valuable and admirable book on "Preventive Medicine." I refer to that part of the Prevention of Leprosy Affecting these Islands (page 329) which reads: "In the Philippines segregation of all discoverable cases reduced new admission by 90 per cent."

I am enclosing a table given out by the Philippine Health Service, which sets forth all the yearly admissions in the Culion Leper Colony for the last 14 years and five months or since the institution of the drastic experiment of compulsory segregation. As may be seen from it, the rate of admission has never been reduced to anyway near 90 cent. at any one time. It is evident that in spite of the fact that many cases are hidden, yet the number of annual admissions has oscillated within relatively narrow limits, without any great noticeable decrease.

If we are to draw at all any conclusion from these figures, it would probably be in some way a conclusion similar to your statement for Hawaii that "segregation has so far had no effect upon the prevalence of the disease, and that there are factors in the control of leprosy not yet understood."

THE FRACTIONAL TEST-MEAL.

To the Editor of THE LANCET.

SIR,—The article by Dr. J. A. Ryle on the fractional test-meal in your issue of Sept. 4th raises afresh the question of the value of test-meals. Concerning the one-hour test-meal Dr. T. R. Brown, physician in charge of the gastro-intestinal clinic of the Johns Hopkins Hospital, wrote in 1916:—

"It was not many years ago that the absence of hydrochloric acid in the gastric juice was considered, if not diagnostic, at least extremely suggestive, of gastric carcinoma. To realise the error in this point of view, and to show that in the vast majority of cases achylia is associated with benign conditions, one has but to mention its presence in a large series of cases. ....."

The writer then proceeds to enumerate 13 groups in which achylia occurs. Not only is gastric carcinoma but one among many of the causes of this condition, but when this particular disease happens to be responsible for the achylia, the one-hour test-meal is of little value, for when hydrochloric acid is absent, the growth is inoperable.

Accordingly, while great advances were being made in the Rontgen diagnosis of diseases of the alimentary canal, the one-hour test-meal lost ground, because it failed to provide information leading to practical results at all commensurate with the difficulties of popularising among patients the old-fashioned stomach-tube. In institutions it hardly held its own with the X rays as a test of gastric motility. For example, in the Mayo Clinic in 1914 a series of 950 patients were examined both by X rays and the single test-meal and the results checked by subsequent operation. The X rays were found to provide the more sensitive test. It was in these circumstances that the view gained ground that the study of the gastric, pancreatic, and intestinal secretions added little, if anything, to the resources of the clinical worker.

We have therefore to inquire at the outset whether the fractional test-meal supplies something which the older method lacked that may win for it a permanent place in the laboratory. Now no stomach containing bismuth, barium, or a tube of any kind whatever is working under physiological conditions, but with Einhorn's tube this fallacy almost disappears, for the inconvenience to the patient is practically negligible. The fractional test-meal provides, then, a picture of the secretory function of the stomach and duodenum obtained under conditions which fairly approximate to the normal. Quite apart from questions of motility, if these secretory studies furnish data of value either in diagnosis or in treatment the case for this method is established. My estimation of the value of such observations of the secretory function throughout digestion and in the resting period is based upon a study of the

American literature, where since 1914 a great body of evidence has accumulated, and upon my experience of fractional test-meals during the past six months at St. Mary's Hospital.

The position is very fairly stated by Rehfuss and Hawk.[1] No extravagant claims are advanced; the method is a useful, if modest, addition to our means of investigation, and we surely have need of every measure that can in any way contribute to accuracy in diagnosis. Moynihan writes:—

"More mistakes are made in the diagnosis of gastric ulcer than is the case in any other abdominal disorder. If all the methods of examination are strictly brought to bear upon cases commonly referred to as those of gastric ulcer, it will be found that in the majority the diagnosis cannot be upheld."

This, apparently, is also the experience of the Mayo Clinic, for Smithies, in an article printed in June this year, states that only 53 per cent. of patients sent to hospital diagnosed as gastric ulcer turn out to be such.

The time, then, is not perhaps inopportune for advancing a plea that no stone should be left unturned in the quest for greater accuracy in gastro-intestinal diagnosis. The first fine careless rapture of our surgical brethren, inspired by the early and brilliant results of gastro-enterostomy, has passed. A more sober spirit is abroad. Many cases have been successfully relieved, others have now been followed from the time they leave the surgeon's hands, through a period of apparent cure, to the return, and often aggravation, of the old symptoms. There has arisen a feeling that more careful selection of cases for operation, based upon exhaustive investigations, must precede further advances, and that any measures which contribute to our knowledge of either motor or secretory abnormalities, with its implied knowledge of the limits of the normal must tend to avert a repetition of these failures. Dr. Ryle's article is a step towards that end.

Nevertheless, it is as well to continue our search for answers to ultimate questions in gastric and intestinal pathology along other lines. To quote the writer whose views open this letter:—

"An attempt to evolve a gastro-intestinal pathology fundamentally on the basis of secretory variations is to lean on a frail reed. ..... The curve is only one of the many clinical data which does not furnish the answer itself, but which adds its little to the many other aids at our command in reaching a true conception of the underlying disease process."

I am, Sir, yours faithfully,

South Audley-street, W., Sept. 6th, 1920. C. M. WILSON.

THE PROBLEM OF DENTAL DISEASE.

To the Editor of THE LANCET.

SIR,—I read with pleasure your annotation under this heading in THE LANCET of August 21st. In this connexion may be mentioned some clinical observations made by me at the Luxor hospital for natives in Upper Egypt prior to 1914. Neither appendicitis nor gastric ulcer appeared among my cases, and cancer was rare. Though syphilis was widespread, yet I found no cases of aneurysm or of locomotor ataxy. As regards cancer, the absence of post-mortem examinations may vitiate my impressions of cancer incidence, but I never saw any kind of growth in a breast nor any cases of mammary abscess. My friend Dr. G. W. Ellacombe, of Livingstone, Northern Rhodesia, had similar experiences among his native patients.

I suggest that immunity from appendicitis and gastric ulcer depended on the nature of the diet, as a result of which, I claim, the population had good teeth. May the absence of gastro-intestinal cancer be due to this also? I would suggest to the Rockefeller Institute that the study of the diet and diseases of the country Arab as compared with his brother living in Cairo and Alexandria might be of value. Owing to the spread of flour-mills and sweet-shops the diet is rapidly changing, but it is still possible to study the native eating coarse wholemeal unleavened bread, and no sugar beyond the natural solution which he extracts from the fibrous cane and from other fruits.

A short time ago Professor J. G. Adami was reported to have stated that the teeth of the U.S.A. citizen were far better than ours. With the utmost respect, I venture to doubt his statement. It is my belief that the teeth of American citizens are extensively diseased, and the very number and importance of their dental surgeons would seem to support my statement. Now that the U.S.A. have gone "dry," and in consequence still more "sweet," the dental surgeons and doctors will doubtless be busier than ever. The suggestion that 10,000 more dental surgeons are required in this country is also attributed to Professor Adami. I protest at being asked to pay for this expensive host of officials when the advanced disease which they are to scrape out and plug can be almost entirely prevented by common-sense feeding and discipline in the home. Dr. Sim Wallace and others have actually proved that prevention is simple and inexpensive. Dr. James Wheatley, medical officer of health for Shropshire, also has figures pointing to the improvement of the children's teeth under war circumstances which are arresting and which I trust he will publish. For example, cow's milk is an entirely unnatural food for the human child, and its consumption in large quantities may have disastrous results to the children and sick people whose staple diet it has become. Just as alcohol in the form of wine, beer, or spirits does no harm, but in many cases positive good when taken in moderation, so it is with commercial sugar and with milk. There is far too much stress laid to-day upon heat calories and far too little upon the number and kind of meals necessary to exercise the teeth and keep the mouth clean and healthy. Much money and illness and many operations for gastric ulcer and appendicitis could be saved by putting the true facts about dental caries before the women of the country.

I am, Sir, yours faithfully,

W. E. NICKOLLS DUNN, M.B. Lond.

Brighton, August 30th, 1920.

[1] Journal of the American Medical Association, August 14th, 1920.

Medical News.

A JOINT Conference of the Central Association for the Care of the Mentally Defective and the National Special Schools Union will be held at the Church House, Westminster, from Thursday to Saturday, Nov. 25th–27th. The Right Hon. H. A. L. Fisher is expected to address the opening session, at which Mr. Leslie Scott will preside. Sir William Byrne will be in the chair on the second day, and Dr. A. E. Eichholz on Saturday morning. Further information from the honorary secretary of the Central Association, Queen Anne's Chambers, Tothill-street, London, S.W. 1.

UNIVERSITY OF LONDON.—Preliminary arrangements for advanced lectures in physiology for the session 1920–21, details of which will be announced later, show a varied programme of courses to be delivered by distinguished physiologists:—

During the first term at King's College Dr. C. Da Fano will lecture on Histology of the Nervous System on Wednesdays, at 4.30 P.M., beginning on Oct. 13th.

At the University Buildings, South Kensington, Prof. A. D. Waller (in conjunction with Mr. J. C. Waller) will give a course of eight lectures on Experimental Studies in Vegetable Physiology and Vegetable Electricity on Tuesdays, beginning on Oct. 12th.

During the second term Prof. M. S. Pembrey, at Guy's Hospital, will give eight lectures on the Physiology of the Embryo, Fœtus, and Newly Born, on Thursdays, at 4.30, and Mr. J. A. Gardner will give a course on Bio-Chemistry (title and place not yet arranged).

In the third term a course of lectures by various lecturers, to be arranged by Prof. F. A. Bainbridge, at St. Bartholomew's Hospital, and Prof. H. E. Roaf will give eight lectures at the London Hospital on Reception of Sensory Stimuli.

All these courses are recognised as advanced lectures which a candidate for B.Sc. honours may name for part of his examination.

The following scheme of intercollegiate advanced work in physiology has been approved for the Honours B.Sc. Examination, and students of the participating colleges are free to attend all the courses:—

First term: Prof. W. M. Bayliss (University College), Physical Chemistry in Relation to Physiology.

Second term: Prof. W. D. Halliburton and Dr. Rosenheim (King's College), Advanced Chemical Physiology; and Prof. M. S. Pembrey (Guy's Hospital), Practical Work on Respiration.

Third term: Dr. J. S. Edkins (Bedford College), Advanced Practical Histology; and Prof. F. A. Bainbridge (St. Bartholomew's Hospital), course of practical work on Electrical Changes in Skeletal and Cardiac Muscle.

Students requiring further information regarding the lectures should address their inquiries to the heads of the laboratories at which they will be delivered.

MANCHESTER ROYAL INFIRMARY.—The course of post-graduate lectures held last year is to be resumed; the first lecture of this session will be held on Tuesday, Oct. 5th. Details of the course will be published in our Medical Diary.

POST-GRADUATE STUDY FOR GENERAL PRACTITIONERS AT ST. ANDREWS.—A short course of post-graduate study for general practitioners will be given at the Clinical Institute, St. Andrews, under the direction of Sir James Mackenzie, commencing on Monday, Oct. 11th. The course, to which only a limited number of members will be admitted, will consist of lecture demonstrations dealing with the symptomatology of disease in its early stages, and will be supplemented by demonstrations on matters of clinical interest in anatomy, physiology, chemistry, bacteriology, ophthalmology, and radiology. The fee for the course is £10 10s. Graduates desirous of attending should communicate with the secretary, the Clinical Institute, St. Andrews, Fifeshire.

Professor J. Bretland Farmer, F.R.S., has been appointed a member of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research.

AT the last meeting of the Dursley (Gloucestershire) Rural District Council the medical officer of health reported that six cases of enteric fever had been notified in a family at Uley.

THE West Suffolk Hospital at Bury St. Edmunds has decided to charge in-patients 10s. weekly. In addition to £6000 given by the Red Cross Society, £9000 will have to be raised locally for the reconstruction of the hospital.

THE sum of £2000 has been raised for the Bolingbroke Hospital, Wandsworth Common, by the Balham and Tooting Traders' Association.

BEQUEST OF A MEDICAL MAN TO HOSPITALS.—The late Mr. Edwin Allan Maling, consulting surgeon to the Sunderland Royal Infirmary, the Sunderland Eye Infirmary, and the Seaham Harbour Infirmary, who died on April 12th, left £500 to the Sunderland Royal Infirmary and £200 to the Sunderland and North Durham Eye Infirmary.

PRESENTATION TO A MEDICAL MAN.—At Penzance, on Sept. 1st, Dr. J. B. Page was presented by the local division of the St. John Ambulance Brigade with a silver cigarette box on the occasion of his leaving for New Zealand, as a mark of acknowledgment for his services as honorary instructor.

MEDICAL MAGISTRATES. — Dr. Sydney Garrett Vinter has been placed on the commission of the peace for the county of Cornwall. Dr. Arthur Briggs Dunne has been appointed a justice of the peace for the West Riding of Yorkshire. Dr. William Edmund Thomas has been placed on the commission of the peace for the county of Glamorgan.

St. Thomas's Hospital Old Students' dinner will take place at the Connaught Rooms, Great Queen-street, W.C., on Friday, Oct. 1st, at 7 o'clock for 7.30. The chair will be taken by Dr. Frederick Foord Caiger. Tickets, price 17s. 6d., can be obtained from the honorary secretaries at St. Thomas's Hospital.

AT a recent meeting of the Axminster (Devon) Board of Guardians a letter was read from the Poor-law Medical Officers Association advocating the elimination of the appointment of part-time district medical officers and the appointment of whole-time medical officers; it was suggested that the board should have one full-time medical officer. The guardians did not consider it advisable to take any action in the matter.

DEVON V.A. HOSPITALS.—From 1914 to 1920 the number of patients admitted to the Devon V.A. Hospitals was 58,200. Of these, 45,475 were treated in V.A. hospitals and 12,725 in civil and private hospitals, as compared with 38,181 in Gloucestershire, 22,103 in Somerset, 21,100 in Dorset, and 6403 in Cornwall.

THE LATE DR. L. SHINGLETON-SMITH.—The death occurred recently of Lionel Shingleton-Smith, of Brecon, in his forty-fourth year, from injuries caused by a motor-car collision. The deceased was the second son of Dr. R. Shingleton-Smith, of Clifton, Bristol, was educated at Bristol and Cambridge, and qualified M.R.C.S., L.R.C.P. in 1905, and M.B., B.Ch. in 1908. After holding the posts of junior house surgeon and casualty officer at the Bristol Royal Infirmary, and house surgeon at the South Devon Hospital, he set up in practice in Brecon, where he was very popular. He held several union and other appointments, and was honorary physician to the Brecknock County and Borough Infirmary.

EXETER DISPENSARY.—At a special meeting of the governors of the Exeter Dispensary held on August 26th it was decided, owing to the increasing deficit on the working of the charity, to make a charge to patients for such things as medicines and dresssings.

ROYAL DEVON AND EXETER HOSPITAL.—A special meeting of the governors of this institution was held on August 26th, when it was decided to alter the rules so as to provide for a charge being made for in- and out-patients. It was also determined to alter the recent decision of the governors, and to use the second storey of the "Victory Wing" for the accommodation of nurses instead of for a children's ward. The children will be provided for by erecting a corridor or bungalow wing in the garden of the hospital. The adoption of this plan, towards which an anonymous donor has already given £500, will result in a saving of £5000.—Dr. J. Delpratt Harris has been appointed honorary consulting medical officer to this hospital. Dr. Harris has been connected with the institution since 1881, when he inaugurated the electrical department, which has now been brought up to modern requirements.

THE LATE DR. R. P. MITCHELL.—Dr. R. P. Mitchell, who died recently in East Africa, had the distinction of serving with the South African Medical Corps on military service in East Africa for three years. Most of his professional career was spent in the Transvaal. He lived at Barberton from 1886 to 1894, when he went to the Rand, returning to Barberton 16 years later. Dr. Mitchell took a prominent part in the Jameson raid, and suffered imprisonment as a member of the famous Reform Committee.

BLIND PERSONS ACT.—This Act, which entitles blind persons to obtain, at the age of 50, a pension to which they would normally be eligible at the age of 70, comes into operation to-day. The Act is intended to apply to those who are so blind as to be unable to perform any work for which eyesight is essential. They must be natural-born British subjects who have resided in the United Kingdom since reaching the age of 30 for an aggregate period of not less than 12 years, and whose circumstances would render them eligible for old-age pensions if they were now 70 instead of 50 years of age. In the event of an appeal against the decision of the local pension committees as to whether a claimant fulfils the statutory condition of blindness, the Ministry may refer the case to a medical man for investigation.

THE LATE DR. G. BOWMAN.—In the death of Dr. George Bowman, whose funeral took place in Manchester on August 31st, the local community have sustained a distinct loss, even though he had given up active practice for some years on account of failing health. Born in 1848, George Bowman was the son of a practitioner of high repute in Old Trafford. He was educated at the School of Medicine in Manchester and at Edinburgh University, where he graduated M.D. in 1873, having qualified M.R.C.S. the previous year. He succeeded his father in practice, and was one of the quiet unobtrusive practitioners who are often, as in this case, among the most popular and successful in their districts. Dr. Bowman leaves a widow and two children.

The Services.

ROYAL NAVAL MEDICAL SERVICE: PAY OF RECRUITING OFFICERS.

BY a revision of the salaries of officers engaged in recruiting for the Navy, notified in Admiralty Orders, medical officers engaged in the recruiting service receive £200 per annum, except the officer at Belfast, who will be paid £150 per annum.

TEMPORARY COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS.

In extension of the notice published in our columns on August 14th, the War Office is granting temporary commissions in the R.A.M.C. for a period of six months, for home service, to a limited number of medical men not over 55 years of age. Remuneration will be at the rate of £600 per annum for those who have not previously held commissions, and £650 for those who have served during the late war for a period of 12 months. In addition they will receive free rations or an allowance in lieu when rations are not issued in kind, and the regulated allowances and expenses when travelling on duty. An outfit allowance of £30 will be made to those to whom it has not been previously issued. Applications should be made at once in writing, to the Secretary of the War Office (A.M.D.1), London, S.W. 1, and should contain a statement of the candidate's age and previous service, if any.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Cmdr. J. C. F. D. Vaughan is placed on the Retired List.

ROYAL ARMY MEDICAL CORPS.

Temp. Major N. G. Cooper to relinquish the acting rank of Lieutenant-Colonel.

Major C. R. M. Morris to be acting Lieutenant-Colonel.

Capt. W. Foot relinquishes the acting rank of Major.

The undermentioned temporary Captains relinquish their commissions and retain the rank of Captain:—W. H. Harvey, W. E. Fraser, A. S. Cook, J. M. Wallace, H. Harrison, A. R. Berrie.

Temp. Capt. C. W. Joynt relinquishes his commission.

Capt. J. McP. Mackinnon is seconded for service with the Egyptian Army.

The undermentioned Lieutenants (temporary Captains) to be Captains:—G. E. L. Simons, E. Parker, L. G. Blackmore, V. J. Bonavia, D. J. Batterham.

SPECIAL RESERVE OF OFFICERS.

The undermentioned Captains relinquish their commissions on account of ill-health contracted on active service:—C. A. McGuire (granted the rank of Major) and G. E. Shand (retains the rank of Captain).

TERRITORIAL FORCE.

Lieut.-Col. A. T. Falwasser resigns his commission and retains the rank of Lieutenant-Colonel.

Major H. G. Smeeth (late Major, R.A.M.C., Spec. Res.), to be Lieutenant-Colonel and to command 1st East Lancs Field Ambulance.

Capt. C. H. Vernon (late Royal Air Force Medical Service) to be Captain.

Major (acting Lieutenant-Colonel) W. F. Roe relinquishes the acting rank of Lieutenant-Colonel on ceasing to be specially employed.

Capt. (acting Major) L. Beesley relinquishes the acting rank of Major on ceasing to be specially employed.

Capts. W. W. Adamson and L. A. Williams resign their commissions and retain the rank of Captain.

Officers resigning their commissions and granted the rank of Major: Capts. A. Anderson, C. S. P. Black, W. A. Brechin.

Capt. R. B. Lilly (late temporary Captain R.A.M.C.) to be Captain.

1st London General Hospital: Major L. B. Rawling is restored to the establishment.

3rd Northern General Hospital: Capt. G. S. Simpson is restored to the establishment on ceasing to hold a temporary commission in the R.A.M.C.

TERRITORIAL FORCE RESERVE.

Capt. C. T. Matthews resigns his commission and retains the rank of Captain.

ROYAL AIR FORCE.

Medical Branch.—The undermentioned are transferred to unemployed list: Capt. (acting Lieut.-Col.) A. P. Bowdler, Capts. R. D. Jones and E. H. L. Le Clezio, and Lieut. R. I. Rhys.

Flying Officer G. H. H. Maxwell to be Flight Lieutenant.

INDIA AND THE INDIAN MEDICAL SERVICE.

Appointments.—Major L. Dunbar, R.A.M.C., to hold civil medical charge of Benares, vice Col. Walker, on leave. Capt. J. N. Turner, Agency Surgeon, Sibi. Capt. P. R. Vakin to hold civil medical charge of Roorkee, vice Capt. J. S. S. Martin. Capt. D. K. Sabhesan to hold civil medical charge of Roorkee, vice Capt. P. R. Vakin. Major P. C. Bedell, on return from military duty, to the charge of the Railway Dispensary, Moradabad. Capt. A. S. Fry, Medical Officer of Seistan Consulate. Major T. J. Carey Evans, Residency Surgeon, Mysore. Major H. H. Thorburn, Residency Surgeon, Baluchistan. Lieut. A. Innes Cox, to hold civil medical charge of the Allahabad District, vice Capt. L. A. P. Anderson. Major A. N. Dickson, to Peshawar. Major A. H. Proctor, First Resident Surgeon, Presidency Hospital, Calcutta.

Resignations.—Capt. P. S. Connellan has resigned his commission. Lieut.-Col. G. A. W. Hall retires from the Service. Major Norman White, Sanitary Commissioner to Government of India, retires, and has received an appointment with Ministry of Health, London. Lieut.-Col. Ashton Street, Principal of Grant Medical College, retires after 30 years' service.

Leave granted.—Lieut.-Col. H. J. Hugo, six months' leave. Lieut.-Col. J. W. Watson, eight months' leave. Major D. P. Goil, Civil Surgeon, Rajshahi, privileged leave for two months. Major W. D. Neal, Assistant to Superintendent, Medical College Hospital, Calcutta, six months' leave. Major V. B. G. Green-Armytage, Resident Surgeon, Presidency General Hospital, Calcutta, six months' leave. Major D. Heron, Medical Officer, Seistan Consulate, eight months' leave. Lieut.-Col. W. Young, Civil Surgeon, Lucknow, six months' leave. Lieut.-Col. L. G. Fischer, combined privilege leave and furlough. Major N. H. Scott, Civil Surgeon, Peshawar, combined leave. Major C. McDonald, Civil Surgeon, Sibsagar, four months' combined leave. Major S. Chuckerbutty, Civil Surgeon, extended leave for five months. Lieut.-Col. J. W. D. Megaw, Principal Medical College, Lucknow, six months' leave.

PAY OF ARMY NURSES.

An Army Order just issued announces the new rates of pay and retired pay of the Q.A.I.M.N.S. and of the permanent nursing establishment of the military families' hospitals, with effect from April 1st, 1920. Briefly the new annual rates of pay are as follows: Matron, £115, rising by £10 yearly to £185; assistant matron, £85, rising by £5 a year to £95; sister, £75, rising by £5 to £85; and staff or charge nurse, £60, rising by £2 10*s.* to £65. In addition, charge pay for matrons of Q.A.I.M.N.S. will be at rates not exceeding £45 a year, and for matrons of military families' hospitals £20 or £30 a year. Retired pay (with effect from April 1st, 1919) will comprise a service element (£3 for each year of service) and a rank element; but a nurse retiring with less than 10 years' service will not be eligible for retired pay. The maximum rates of these two elements together are as follows: Matron, £170; sister, £75; staff nurse or charge nurse, £55.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN, Hunter-street, Brunswick-square, W.C.

Post-Graduate Course on Venereal Diseases for Medical Women.

A Course arranged by the London (Royal Free Hospital) School of Medicine for Women, the Royal Free Hospital, the Elizabeth Garrett Anderson Hospital and the London Lock Hospital, for the instruction of qualified medical women in the Treatment of Venereal Diseases. The Course will extend over two weeks.

MONDAY, Sept. 13th.—12 noon, Lecture:—Mr. O. T. Dinnick: Modern Treatment of Venereal Disease (at the London (Royal Free Hospital) School of Medicine for Women). 5 P.M., Mrs. Rorke, M.B.: Out-patient Cliniques for Women and Children (at the Royal Free Hospital, Gray's Inn-road).

TUESDAY.—9.30 A.M., Injections (at the London Lock Hospital, 283, Harrow-road, W.) 2 P.M., Mr. C. Gibbs: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road). 6.30 P.M., Dr. Ruth Balmer: Out-patient Cliniques for Women and Children (at the Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.)

WEDNESDAY.—9 A.M., Dr. Morna Rawlins: Visit to Maternity Wards and Labour Department (at the London Lock Hospital, Harrow-road). 11 A.M., Dr. Mary Schofield: Pathological Demonstrations (at the Royal Free Hospital). 3.30 P.M., Mr. J. E. Lane: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road).

THURSDAY.—2 P.M., Mr. J. E. R. MacDonagh: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road). 5 P.M., Injections (at the Royal Free Hospital).

FRIDAY.—10 A.M., Mrs. Rorke, M.B.: Treatment Ante-natal Cases (at the Royal Free Hospital). 5 P.M., Mr. J. J. Abraham: Injections and Out-patient Clinique for Women and Children (at the London Lock Hospital, 91, Dean-street, W.). 6.30 P.M., Dr. Ruth Balmer: Out-patient Cliniques for Women and Children (at the Elizabeth Garrett Anderson Hospital).

SATURDAY.—9.15 A.M., Injections (at the Elizabeth Garrett Anderson Hospital).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Sept. 13th.—2 P.M., Mr. B. Harman: Eye Department. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.

TUESDAY.—2 P.M., Mr. Banks Davis: Diseases of the Throat, Nose, and Ear. 2 P.M., Dr. Pernet: Skin Department.

WEDNESDAY.—10 A.M., Dr. A. Saunders: Medical Diseases of Children. 2 P.M., Mr. D. Armour: Visit to Surgical Wards.

THURSDAY.—2 P.M., Dr. G. Stewart: Medical Out-patients. 2 P.M., Mr. B. Harman: Eye Department.

FRIDAY.—2 P.M., Dr. Burnford: Medical Out-patients. 2.30 P.M., Mr. Addison: Visit to Surgical Wards.

SATURDAY.—2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.

MONDAY, Sept. 13th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

Communications, Letters, &c., to the Editor have been received from—

A.—Dr. A. Abrahams, Lond.; Capt. V. R. S. Ayyer, I.M.S., Karachi; Prof. J. Albert, Manila.

B.—Prof. J. Barcroft, Cambridge; Dr. G. A. Brown, Glasgow; Dr. U. N. Brahmachari, Calcutta; Board of Scientific Societies, Lond.; Board of Control, Lond., Sec. of.

C.—Dr. W. Cramer, Lond.; Dr. H. P. Cholmeley, Forest Row; Central Association for the Care of the Mentally Defective, Lond.; Children's Country Holidays Fund, Lond.

D.—Dr. V. Dickinson, Lond.

E.—Mr. F. G. East, New Malden.

F.—Prof. J. E. S. Frazer, Lond.

G.—Lt.-Col. E. Goodall, Lond.; Capt. J. K. Gaunt, R.A.M.C.; Dr. W. H. Gregory, Beverley; Dr. L. H. Guest, Lond.

H.—Messrs. Handley Page, Ltd., Lond., Prof. F. Hobday, Lond.; Mr. J. T. Henderson, Pietermaritzburg.

I.—India Office, Lond.

J.—Jamaica, Registrar-General of, Spanish Town.

K.—Dr. W. N. W. Kennedy, Croydon; Miss M. Knightley, Lond.

L.—Dr. E. B. Leech, Manchester; Dr. R. B. Low, Lond.; Dr. C. Lillingston, Gorleston; Dr. T. L. Llewellyn, Newcastle; Dr. J. R. Lord, Dalkey; Liverpool, Medical Officer of Health of.

M.—Dr. D. McKenzie, Lond.; Dr. J. J. R. Macleod, Paisley; Medical Research Council, Lond.; Dr. R. S. Miller, Lond.; Dr. A. A. Mumford, Manchester; Dr. W. C. Mackenzie, Lond.; Dr. G. N. Meachen, Westcliffe-on-Sea; Ministry of Health, Lond.; Metropolitan Asylums Board, Lond.; Ministry of Agriculture and Fisheries, Lond.; Ministry of Pensions, Lond.

N.—National Anæsthesia Research Society, Columbus, Ohio.

O.—Dr. T. Orr, Lond.

P.—Messrs. G. P. Putnam's Sons, Lond.

Q.—Queen's Hospital for Children, Lond., Sec. of.

R.—Dr. E. T. Roberts, Glasgow; Mr. A. M. Rovin, Detroit.

S.—Prof. W. Stirling, Manchester; Stretford, Medical Officer of Health of; Dr. R. E. Smith, Barry; St. Thomas's Hospital, Lond.; Society of Medical Officers of Health, Lond.; Dr. G. A. Stephens, Swansea; Mr. T. Sington, Manchester; Scientific and Industrial Research Dept., Lond.; Sir E. F. Schafer, Cassis; Save the Children Fund, Lond.

T.—Dr. A. H. Thompson, Liskeard.

W.—Dr. A. Wood, Rugby; Dr. W. J. H. Wood, Southampton; Sir C. Wallace, Lond.; Capt. J. T. A. Walker, R.A.M.C.(T.F.); Dr. R. L. M. Wallis, Lond.; West London Hospital Post-Graduate College; Dr. K. M. Walker, Lond.; Dr. F. G. Wallace, Lond.; Dr. C. M. Wilson, Lond.; Dr. J. P. Walker, Ryde,

Appointments.

ALDOUS, G. F., F.R.C.S. Edin., has been appointed Consulting Surgeon to the Totnes Hospital, South Devon.
BURNELL, A. C., M.B., Honorary Assistant Surgeon to the Royal Cornwall Infirmary, Truro.
CRAIG, T. (Dudley), Medical Officer of Health to Weetslade Urban District Council.
GRANT, W., M.B., Ch.B. Edin., B.Hy., D.P.H. Durh., Medical Officer of Health to Easington Rural District Council.
GREGORY, W. H., M.D. Edin., Medical Officer to Poor-law Institution, Children's Home, Beverley and Tickton; also to Beverley Postal District.
STEVENS, B. C., M.D., M.S. Durh., F.R.C.S. Edin., L.R.C.P. Lond., D.P.H. Oxon., Assistant Medical Officer of Health and Chief Tuberculosis Officer, County Borough of Portsmouth.
THOMAS, R. E., M.D. Lond., B.S., M.R.C.S., L.R.C.P. Lond., D.P.H. Bristol, Assistant Medical Officer of Health, County Borough of Bath.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. M.O. £500.
Aberdeen University.—Lectureship in Bacteriology.
Abergavenny, Monmouthshire Asylum.—Jun. Asst. M.O. £300.
Ayr County Hospital.—Res. H.S. £120.
Ayrshire Sanatorium, Glenafton, New Cumnock.—Res. Asst. £250.
Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £250.
Battersea General Hospital (Incorporated), Battersea Park, S.W.—Third Res. M.O. £200.
Bedford County Hospital.—Asst. H.S. £150.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—Asst. P. 50 gs. Also Female H.S. £100.
Bethnal Green Infirmary, Cambridge-road, Bethnal Green, E.—Asst. Med. Supt. £500.
Birmingham General Hospital.—Surg. Registrar. £200.
Bootle County Borough.—Tuberc. O. and Dep. M.O.H. £750.
Bradford Royal Infirmary.—H.S. £200.
Brighton Education Committee.—Female Asst. School Doctor. £500.
Brighton, Royal Sussex County Hospital.—Jun. H.S. £150.
British Guiana.—Asst. M.O.H. £600.
Cancer Hospital, Fulham-road, S.W.—Two H.S.'s. £150.
Central London Ophthalmic Hospital, Judd-street, St. Pancras.—H.S. £100.
Chester County Asylum.—Third Asst. M.O. £350.
Children's Infirmary, Cleveland-street, W.C.—Female Asst. M.O. £478.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £100.
Colchester, Essex County Hospital.—H.S. £200.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Derby Borough Mental Hospital.—Asst. M.O. £350.
Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £200.
Devon and Cornwall Sanatorium, Didworthy, South Brent.—Locum Tenens. £6 6*s*. per week.
East Africa.—M.O. to C.M.S., Kavirondo.
Eastbourne, Princess Alice Hospital.—Res. M.O. £175.
Glamorgan County Asylum, Bridgend.—Jun. Asst. M.O. £350.
Govan District Asylum, Cardonald, Glasgow.—Jun. Asst. P. £325.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. Anæsth. £25. Also Asst. Res. M.O. £150.
Huddersfield Royal Infirmary.—Asst. H.S. £150.
Hull City Asylum, Willerby, near Hull.—Jun. Asst. M.O. £300.
Hull Royal Infirmary.—Asst. H.S. £150.
Ingham Infirmary and South Shields and Westoe Dispensary.—Jun. H.S. £175.
Lancaster County Asylum.—Asst. M.O. £300.
Lincoln County Hospital.—Jun. H.S. £150.
Liverpool, Brownlow Hill Poor Law Hospital.—Res. Asst. M.O. £300.
London Lock Hospital, Soho, W.—Hon. S.
Macclesfield General Infirmary.—Res. H.S. £200.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Maidstone, West Kent General Hospital.—Two H.S.'s. £220.
Manchester, Ancoats Hospital.—Res. Surg. O. £250.
Manchester Royal Infirmary, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £300.
Manchester Royal Infirmary, Central Branch, Roby-street.—Res. M.O. £250.
Margate, Princess Mary's Hospital for Children, Cliftonville.—Jun. Asst. M.O. £515 6*s*.
Metropolitan Asylums Board.—Jun. Asst. M.O.'s. £515 6*s*.
Metropolitan Hospital, Kingsland-road, E.—Cas.O. and Res. Anæsth. £120. Also Asst. H.S. and Asst. H.P. £100 each.
Middlesex County Council, Harefield Sanatorium.—Res. Med. Supt. £700.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Out-patient M.O. £150.
National Hospital for the Paralysed and Epileptic, Queen-square, Bloomsbury, W.C.—Registrar. £200. Also Sen. H.P. £150.
Newcastle-upon-Tyne City Mental Hospital, Gosforth.—Sen. Asst. M.O. £500.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Asst. S.
Northampton General Hospital.—H.S. £200.
Nottingham City Education Committee.—Jun. Asst. Sch. M.O. £500.
Oldham Royal Infirmary.—H.S. £250.
Plaistow Fever Hospital.—Second Asst. M.O. £200.
Plymouth, South Devon and East Cornwall Hospital.—H.S. £200.
Preston and County of Lancaster Royal Infirmary.—H.S. and H.P. £180 each.
Prince of Wales's General Hospital, Tottenham, N.—H.P. and H.S. £200. Jun. H.S. and Jun. H.P. £120.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.S. £100.
Reading, Royal Berkshire Hospital.—H.P. and Second H.S. £200 each.
Royal Chest Hospital, City-road, E.C.—Asst. M.O. £450.
Royal Free Hospital, Gray's Inn-road, W.C.—Female Obstet. H.S. £50.
St. Mary's Hospital, Paddington, W.—Med. Supt. £350.
Salford Royal Hospital.—Res. Surg. O. £250. H.P., H.S., Jun. H.S., and Cas. H.S. £150 each.
Scarborough Hospital and Dispensary.—Two H.S.'s. £150.
Scottish Board of Health.—Dist. M.O.'s. £1000.
Sheffield Royal Hospital.—Asst. Cas. O. £150.
Sheffield Royal Infirmary.—H.P. and H.S. for Ear, Nose and Throat. £150 each.
Sheffield University, Department of Pathology and Bacteriology.—Director. £800. Asst. Director. £500. Curator of Path. Museum. £600.
Southampton County Borough.—Asst. M.O.H. £500.
South London Hospital for Women, South Side, Clapham Common, S.W.—Female Asst. S. Also Clin. Assts.
Surrey County Council, Urban District Council of Barnes.—M.O.H., &c. £800.
Sydney University, New South Wales, Australia.—Chair of Dentistry. £1100. Also Chair of Physiology. £1150.
Talgarth, Breconshire, South Wales Sanatorium.—Jun. Asst. Res. M.O. £400.
Uganda.—M.O. to C.M.S. Mengo Medical School.
Union Mental Hospital Service, South Africa.—Jun. Asst. P.'s. £400.
Ventnor, Isle of Wight, Royal National Hospital for Consumption and Diseases of the Chest.—Asst. Res. M.O. £300. Also Locum Tenens. 7 gs. per week.
Westminster Hospital, opposite Westminster Abbey.—Asst. H.S.
Westmorland Sanatorium and Home, Meathop, Grange-over-Sands.—Res. Asst. M.O. to the Westmorland Sanatorium and Asst. Tuberc. O. for Westmorland. £350.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

Births, Marriages, and Deaths.

BIRTHS.

ADAMS.—On August 28th, at Prospect House, Clitheroe, the wife of Dr. F. S. Adams, of a son.
AVELING.—On Sept. 2nd, at Chalk Hill, Bushey, the wife of Kenneth Aveling, M.B., of a son.
BLOMFIELD.—On August 31st, at Cornwall-terrace, Regent's Park, the wife of Dr. J. Blomfield, O.B.E., of a son.
CONNAN.—On Sept. 1st, of 17*D*, Avonmore-road, W. Kensington, to Dorothy (Mackintosh), wife of Donald Murray Connan, M.B., B.S.—a daughter.
HEALD.—On Sept. 2nd, at Kimpton, near Welwyn, the wife of Lieutenant-Colonel C. B. Heald, C.B.E., M.D., of a daughter.
LITHGOW.—On August 30th, at The Close, Tetbury, the wife of Major E. G. R. Lithgow, R.A.M.C., M.R.C.S., L.R.C.P. Lond., of a son (Michael John).
MCCREERY.—On Sept. 2nd, at Huntly, Parkstone, Dorset, the wife of Major A. T. J. McCreery, M.C., M.B., B.Ch., B.A.O. Dub., R.A.M.C., of a daughter.
PAYNE.—On Sept. 4th, at Waungron-road, Llandaff, Cardiff, the wife of Dr. J. Rowland Payne, of a daughter.

MARRIAGES.

DEWAR—D'ALMAINE.—On Sept. 7th, at St. Nicholas Church, Abingdon-on-Thames, by the Rev. H. A. Kennedy, M.A., vicar, assisted by the Rev. R. C. MacKeown, M.A., Robert Scott Dewar, M.A., M.B., Ch.B., Glasgow, to Roubaix, elder daughter of Mr. H. G. W. d'Almaine, The Square, Abingdon.
HANCOCK—BRANWELL.—On Sept. 2nd, at Christ Church, Lancaster-gate, W., by the Rev. Geoffrey Browne, M.C., Allen Coulter Hancock, M.C. (with two bars), M.R.C.S. Eng., L.R.C.P. Lond., Major (late R.A.M.C.)., to Vera Primrose Branwell, elder daughter of Mr. and Mrs. Alfred Branwell, Penzance, Cornwall.
REES—HUGHES.—On Sept. 2nd, at the Parish Church, Maidstone, by the Rev. Charles E. Hughes, vicar of Woodhouse, Sheffield, assisted by the Rev. Canon Hardcastle, vicar of the parish, William Arthur Rees, M.D., F.R.C.S., son of the late F. W. J. Rees, I.C.S., and Mrs. Rees, of Swanage, Dorset, to Olive Carey, second daughter of the late Henry A. Hughes, and Mrs. Hughes, of Maidstone, Kent.
SUTTON—GIBBS.—On August 28th, at St. Mary's, Bryanston-square, by the Rev. S. N. L. Ford, M.A., Captain W. H. Sutton, R.A.M.C., L.R.C.P., L.R.C.S. Ed., attached Egyptian Army, to Madeleine Ella, younger daughter of Mrs. W. H. Gibbs, Pinner-road, Harrow.

DEATHS.

ALBAN.—On Sept. 3rd, in London, after an operation, Evan Alban, M.D. St. And., M.R.C.S. Eng., L.S.A., of Aberayron, Cardiganshire, and formerly of Lindfield, Sussex, aged 72 years.
EDWARDS.—On August 27th, at Tor-na-Dee, Aberdeen, Cyril Henry Edwards, M.B., B.S. Lond., M.R.C.S. Eng., L.R.C.P. Lond., L.D.S. R.C.S. Eng.
HARRIS.—On Sept. 1st, at Eastbourne, Frederick Rutherfoord Harris, J.P., of Llangibby Castle, Monmouthshire.
NOTT.—On August 26th, suddenly, from heart failure, while on a visit to the Engadine, Arthur Holbrook Nott, Lieutenant-Colonel, Indian Medical Service (retired), of 22, Drayton Court, London, S.W., second son of the late William Nott, of Devizes, aged 58.
PASLEY.—On August 26th, at Port Harcourt, Nigeria, Claud John Burgoyne Pasley, M.R.C.S. Eng., L.R.C.P. Lond., Colonial Medical Service, Captain, R.A.M.C.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

HEALTH TEACHING IN THE UNITED STATES: PROFESSOR SEDGWICK'S LECTURES AT CAMBRIDGE.

BY SIR G. SIMS WOODHEAD, K.B.E., V.D., M.D., LL.D.,
PROFESSOR OF PATHOLOGY, UNIVERSITY OF CAMBRIDGE.

DURING the early part of the present Long Vacation Course the Cambridge medical students and others interested in the advancement of sanitary science and public health were privileged to hear something of the methods of sanitation employed, and of the health work now being carried on in the United States of America. After a recent visit to the United States a former vice-chancellor, Sir Arthur Shipley, arranged for Professor W. T. Sedgwick, of Boston, professor of biology and public health at the Massachusetts Institute of Technology, to visit Cambridge, attend lectures, and deliver a short course on the organisation of the United States Public Health and other sanitary services, and on the means adopted for education and training in these matters not only of public health officers and sanitary engineers but of the general public.

University and Technological Education in the United States.

In five lectures on this subject Professor Sedgwick set out clearly and concisely the important bearing of study and research on the organisation of public health services in America. Pointing out that England was the cradle of public health and sanitation, Professor Sedgwick stated that our local public health authorities had, in the first instance, assumed responsibilities that the State had failed —or had been unwilling—to shoulder, and that in America the development of sanitation had followed on much the same lines. In Germany, instead of beginning at the periphery of the system, they had attempted from a bureaucratic central organisation to build up and control a comprehensive public service and to lay down by line and rule the duties both of doctors and of the people. The central authority assumed powers and responsibilities that in Anglo-Saxon communities had early been acquired by local bodies. Only later had centralisation been adopted in the United States in order that general interests might be protected and common action taken in large areas, as, for example, in the matter of the protection of a river running through several States.

Dealing with impure water-supplies and their rôle in the production of typhoid and cholera, Professor Sedgwick emphasised the fact that organisms other than those producing cholera and typhoid sometimes accounted for more deaths than do water-borne typhoid germs, and referred to Mr. Allen Hazen's observation that for every death from typhoid resulting from infection through water two or three deaths occur from diseases such as paratyphoid, diarrhœa, and enteritis. Many cases of acute diarrhœa recover, others succumbing with alarming rapidity. In the United States the skilled layman appears to have played a much more important part in the advancement of preventive medicine and sanitation than he has been encouraged to play in this country. Sanitary engineering and public health problems are handled not only by laymen specially trained as health officers, but by medical men whose interest in what may be termed "bedside medicine" is comparatively slight. There has thus grown up a corps of sanitary officers of great value. One advantage of this system is that the clinician, whilst benefiting by the experience of the sanitary officer and utilising it to the full in his everyday work, need have no fear that the sanitary officer, who claims to be trained only in the preliminary science branches of medicine will feel called upon or competent to interfere in the diagnosis and treatment of the medical practitioner's private patients.

Laymen as Sanitary Officers.

The Massachusetts Institute of Technology, combining forces with the Medical School and the University of Harvard, was the first school in America to make any systematic attempt to train health officers, sanitary inspectors, and engineers. It was "an assembled school" in which a lecture on chemistry here, a lecture on physiology there, with a few special lectures added or thrown in, was deemed sufficient to serve the purpose. Later a more prolonged and complete course was provided. This was attended by medical men, of course, but also by graduates in science and engineering, who soon constituted a useful body of health officers for American towns. From this source have also been supplied sanitary workers in China, Fiji, and elsewhere, members of a skeleton sanitary corps in the U.S. army and skilled men ready to undertake, under the American Red Cross, crusades against tuberculosis and other infective and parasitic diseases, not only at home but abroad, wherever the interests of America are involved or its sympathies aroused. Now, however, the good work has spread to the Johns Hopkins University, which up to 1918 had no adequate school of public health, but has since built up the most advanced and complete Public Health School in the United States. In 1914 the Rockefeller Foundation, realising the lack of trained personnel, and the fact that men who had passed through the ordinary medical curriculum were mostly neither qualified to deal with, or really interested in, public health, made arrangements to found at the Johns Hopkins University in Baltimore a well-equipped and fully endowed School of Hygiene, Preventive Medicine, and Sanitary Science which, though working with the medical department, should be separate from it. For the teaching at the Harvard Medical School and the Massachusetts Institute of Technology there was no endowment—nothing but the goodwill of certain professors and the students' fees—£50 a year from each of the few students. Now all this is being altered, and at Baltimore special departments are being planned, each to be placed under some distinguished teacher or organiser. Professor W. H. Welch, the well-known pathologist of the Johns Hopkins Medical School, has resigned that position to take up the duties of principal and director of this new school, and Dr. William H. Howell, professor of physiology and formerly dean of the Medical School, has accepted the post of assistant director. These appointments, were there nothing else, indicate the estimate formed by the highest educational circles of the new public health school. Up to June last only one student had graduated in public health from the Johns Hopkins School, but in Boston, with its enthusiastic personnel though smaller resources, some 50 candidates have already been trained in public health and sanitary science, and have graduated from the Harvard Technology School in these subjects. In both schools an attempt is being made to educate experts or leaders in sanitary investigation, organisation, and education. The schools are being fully equipped and staffed by a combination of the best organisers and teachers in the country. Professors of pathology, bacteriology, preventive medicine, biochemistry, physiology, engineering, hygiene, and the like are being appointed. Experts are dealing with biometrics and vital statistics; industrial hygiene; practical public health work and laboratory methods; social and mental hygiene; social service work in the people's homes and at the hospital; the nature and prevention of communicable diseases; parasitology and epidemiology; applied hygiene; immunology and serology; the principles of nutrition and the analysis of foods; sanitary engineering and allied subjects. Similar schools are to be founded and developed in San Francisco, New Orleans, and Chicago, and Professor Sedgwick points out that with such a nucleus as already exists there is no reason why a strong public health school of the same type should not be built up in Cambridge.

Propaganda Work.

One thing came out very clearly in Professor Sedgwick's lectures; our American brethren take a much more comprehensive view of the duties of sanitary and hygiene schools than do we in this country. In these schools they have developed a service for the education of the public, and lecturers and teachers are sent out trained to hand on to the public the elements of general and personal hygiene. For example, in connexion with the educational division of the American Commission for the Prevention of Tuberculosis in France, Professor S. M. Gunn (an American of Irish stock) has organised travelling exhibitions and "poster" services inculcating open windows, personal bathing and cleanliness, care of the teeth, and so forth. In their work in France the Commission had been content to popularise and organise knowledge already acquired, much of which was due to the efforts and research of French medical men and scientific investigators, which were second to none in the world. There was, however, in that country a lack of coördination and coöperation of public authorities and of public health education, and it was this education and coördination that the American Commission had attempted to bring about.

As an example of the kind of public health work that is now being initiated and carried on in the United States a Health Bulletin with the motto "The Health of the People the Beginning of Happiness," published by Dr. F. P. Denny, the health officer of Brookline, Massachusetts, a copy of which is sent out to every household in Brookline, was instanced. Professor Sedgwick explained that all manner of common-sense advice is given in this bulletin. The necessity of attention to small details is urged most strongly; the principle causes of death of Brookline residents are given and means of prevention suggested; the "wear and tear" diseases are described. The author advises that "a medical examination every year is the best kind of life assurance." He points out how some of the 65

deaths from pneumonia and influenza could have been prevented. Of cancer he asks: "Can it be cured?" "Tuberculosis," he says, "is preventable"; "Why, then, were there 25 deaths from this disease in Brookline?" "Flies are filthy"; "there are no substitutes for milk and the milk-supply should be the best obtainable"; a record, analyses, and reports on the milk sold in Brookline are given. Were we to publish similar records and reports in this country actions for libel might ensue. "Food hints" are given and specimen "low cost diets" for a family of five, with recipes, are included. Health maxims and aphorisms are quoted, and striking and easily remembered alliterative phrases given: "Flies, food, and fingers"; "Dirt, diarrhœa, and dinner"; "To cure is the cry of the past, to prevent is the need of the future"; "Health is easier kept *than* regained," and so on.

Professor Sedgwick said that the bulletin afforded some indication of the kind of work that had been and is being carried on by officers of health, whether medical men or laymen, in the United States.

In a letter from the State Commissioner of Health of Virginia to Professor Sedgwick Dr. E. G. Williams says:—

Before the reorganisation of the State Board of Health the appropriation by the Legislature for two years was $8000. Now you will notice from the Budget that the appropriation for the two years is a little short of one million dollars. Typhoid has been reduced from approximately 15,000 cases the first year of our work to 3500 last year. We hope it will not be many years before it will disappear.

Professor Sedgwick said that lectures, illustrated by lantern slides, posters, diagrams, and circulars dealing with public health education, were given all over the States. These showed what and how much could be done. He quoted a lecture on Trudeau's work on consumption, wherein the history of the development of a successful sanatorium was traced, and the methods employed with excellent results were described. It was pointed out in the lecture that, as in other sanatoriums, only by training in useful and carefully regulated work could the patients be interested and encouraged, their moral raised, and the disease checked.

Professor Sedgwick's own work as a teacher in training health officers and in connexion with the Massachusetts State Board of Health, his researches on the protection and purification of water-supplies and the purification of sewage, are amongst the most important carried out in recent years, and his contributions to epidemiology in the tracing and stamping out of endemic and epidemic diseases have been of national value. We are grateful to him for coming to give us of his wide and ripe experience, and to his colleagues for sparing him to us for a part of their University session.

INDUSTRIAL BLINDNESS.

THE returns of the civilian after-care department of the National Institute of the Blind show Lancashire to have 4202 sightless persons as compared with 2593 in Yorkshire. This difference is largely due to the character of the industries carried on in the two counties. Mining and steel industries are both highly dangerous occupations, especially with regard to the eyes of the workers. In spite of the attention given by the local authorities to the prevention of such injuries, it appears that the number of those who have lost their sight from industrial causes has increased during the last ten years. On the other hand, the compulsory notification of ophthalmia neonatorum has resulted in a great diminution of infantile blindness.

PUBLIC HEALTH AT CAPETOWN.

THE population of the city of Capetown was estimated to number 172,050 on Dec. 31st, 1918, no increase having occurred during the previous twelve months, the deaths indeed (7892) having exceeded the births (5482). There has been no complete census enumeration since 1911; the European population was estimated at 89,700 in December, 1917, and this estimate is considered to hold good for the next year. The period for which Dr. A. Jasper Anderson, medical officer of health to the city, presents his report is the twelve months ending June 30th, 1919, which he describes as "undoubtedly the blackest year in the annals of the city with regard to the health of the people. The extremely severe epidemic of influenza in October, 1918, has vitiated all the health statistics, and renders all comparisons with previous years fallacious."

The general birth-rate was 31·86 per 1000, that for Europeans being 24·59, and for non-Europeans 39·76, as compared with 35·44, 27·44 and 44·12, the ratios for 1918. The general death-rate was 45·86, that for Europeans being 26 and for non-Europeans 67·48; when corrected for visitors these ratios become 42·38, 22·78, and 63·74 respectively. The European male death-rate was 25·42, and that for females 20 per 1000. In the month of October the deaths numbered 4588, out of the year's total of 7890; this, when compared with the 245 deaths in October of the year preceding, gives some idea of the influenza visitation. The infant mortality ratio was 224·37 per 1000 births, compared with 152·28 in 1918; for Europeans these ratios were 114·69 and 79·24; October and November were particularly fatal to the new-born infants, 415 dying in these two months out of the total 975 during the year. There was great variation in the different wards of the city as regards this infantile mortality; among European babies 291 per 1000 born died in the Harbour ward (No. 2), but only 42 per 1000 in Kalk Bay (No. 14); while among non-Europeans 397 per 1000 died in Mowbray and 179 in Park ward; this slaughter of the innocents is therefore to a great extent preventable.

Infectious Diseases.

There were 444 cases of *enteric fever*, of which 234 were among Europeans (2·61 per 1000), with 23 deaths; 85 of these cases occurred in Woodstock and Salt River wards, together with 59 among non-Europeans, making a total of 144 cases in these two wards, which have no drainage system and are overcrowded. *Tuberculosis* was notified (or discovered) in 709 fresh cases (of whom 129 were Europeans), compared with 830 (of whom 134 were Europeans) in the previous year; the death-rate for Europeans was 0·84 per 1000 (compared with 0·87 in 1917–18). *Influenza* reached Capetown in September, 1918, and came to an end in the last week of October. It caused 4041 deaths, of which 961 were among the European residents, the death-rate being 10·7 per 1000 for Europeans, 37·4 for natives, and 23·4 for the whole population. Vigorous and successful measures were taken to deal with the epidemic, and inoculation with a polyvalent vaccine was used with good effect. The composition of this vaccine was: *B. influenzæ* (Pfeiffer) 200 millions, streptococci 1000 millions, and pneumococci 800 millions per c.cm., with a dosage of 0·25 c.cm.

Strenuous efforts for the extermination of mosquitoes continue to be carried out on the usual lines, and "many inhabitants have expressed their appreciation of the comfort derived from the diminution of the annoyance caused by this insect." Rat-catching is also carried out systematically, 6079 having been destroyed in the course of the year. It is noteworthy that only 17 cases of measles, and not a single case either of small-pox or of scarlet fever, occurred in Capetown during the two years, July 1st, 1917, to June 30th, 1919.

The report is fully illustrated by tables and diagrams. It might be suggested that the ward-populations be stated, so that the relative incidence of infectious diseases, &c., in various parts of the city might be ascertained. The mere statement of the number of cases or deaths does not show comparative severity of incidence.

FOOD CONTROL IN GERMANY.

A PARAGRAPH appears in the *Economic Review* (Sept. 3rd) which affords an interesting comparison of the food control position in Germany in certain directions with that in this country. It is as follows:—

An outcry for the release of bread and foodstuffs from Government control is making itself loudly heard. It is stated in the technical organ, *Die Mühle*, that while 25·40 per cent. of the price of 100 kg. of rye goes to the farmer, the Government absorbs 32·60 per cent., mostly in the futile expenses of the official apparatus of control. Bread is now Mk.1 per lb., as against 12 Pfennig before the war, yet the Government operations show a yearly deficit of Mk.4,7 milliards. It is pointed out, however, that a hundredweight of foreign corn costs Mk.500 to 600, and that the present price of bread in Germany is considerably below its value in the world market.

Germany has, no doubt, pushed the policy of subsidising essential foods much on the lines pursued by our Government, and the withdrawal of that policy must, at all events for a time, tend to advance prices. It is to be hoped that the harvests this year will show a good return, and so help to ease the situation.

ANNIVERSARY OF COMMERCIAL AVIATION.

SINCE the Handley Page Pioneer Commercial Air Service was inaugurated a year ago the London to Paris service has been established, so as to necessitate a custom house on the Cricklewood aerodrome. A Royal air mail service from London to Holland was started on July 6th, and another to Belgium on July 19th. In August London was linked up to Berlin, Hamburg, Bremen, Warnemünde, Malmö, Copenhagen and Christiania via Amsterdam. During the period from July 25th to August 31st inclusive 848 passengers were carried on these services. The total number carried from Sept. 2nd, 1919, to August 31st, 1920, inclusive, was 2988, the freight and mails amounted to 149,975 lb., and the distance covered to 213,350 miles. Goods carried ranged from valuable jewellery, samples of goods, to babies' cradles, heavy chemicals, and machinery weighing a quarter of a ton in one piece. Livestock included cats, dogs, fowls, and lobsters. Letters can be sent by air to Paris or Brussels merely by marking them "By Air Mail" in the top left-hand corner and affixing 2*d*. per ounce extra in stamps.

A POISON IN MENSTRUAL BLOOD.

B. Schick, in the *Wiener klinische Wochenschrift*, No. 19, 1920, records that a bunch of roses held for some time in the hand of a menstruating woman drooped and faded within 24 hours. It appears that the injurious effect on cut flowers of contact with this particular woman had been known to others and some experiments were made on the supposed menstrual poison which is designated by the name "menotoxin." The action is not one common to all women during menstruation. The anemone seems specially susceptible to the supposed poison—this flower held in the hand for 10 minutes by the person experimented on faded in four hours, and the effect was most marked during the first 24 hours of menstruation. Even the activities of yeast in dough were said to be affected. The medium of the assumed poison is the sweat. If the flowers were held in the hand encased in an indiarubber glove they were unaffected, nor were they affected by being vigorously breathed on or by the saliva. A swab of the sweat taken from the axilla or palm of the hand placed in a vessel of water containing flowers acted on them in the same way as did contact with the hand. The serum of the menstruating individual was inactive, while the blood-clot was markedly poisonous. Menstrual blood itself has proved to be highly poisonous to flowers and twigs; its poisonous activities were not affected by heating to 56° C., and were only slightly weakened after heating to 100° C.

ANÆSTHETICS IN VETERINARY SURGERY.

IN his presidential address recently delivered at Bristol before the members of the Mid-West and South Wales Veterinary Association Mr. W. M. Scott, F.R.C.V.S., pleaded for organisation in the veterinary profession to attain the objects which all veterinary surgeons desired. The Animals (Anæsthetics) Act, recently added to the statute-book, had lost at the eleventh hour its most important clause—namely, that no anæsthetic should be administered unless by a duly qualified veterinary surgeon. The object of the promoters of the Bill had been to obliterate surgical pain. Could anyone, he asked, imagine anything more incongruous than the empiric, who had had no collegiate training, administering an anæsthetic to produce *complete* anæsthesia? Imagine a human being chloroformed by a barber! The animal might have a whiff of chloroform, but who was going to prove that the operation was painless? Mr. Scott added with regret that the unqualified element which resisted the Bill was a stronger and better organised force than that representing the veterinary profession itself.

DRY CELLS AND BATTERIES.

Messrs. Siemens Brothers and Co., Ltd., of Woolwich and Palace-place-mansions, Kensington Court, W., have just issued a new and enlarged edition of their catalogue of dry cells. The list is a very comprehensive one, the number of types and sizes manufactured at their factories exceeding 600. The applications are, of course, numerous; but amongst the cells described are those adapted for medical work, such as galvanisation, faradisation, ionic-medication, galvanocautery, exploring lamps, and so forth. The portability of these cells is an obvious advantage in medical practice. The list includes also specifications of "inert" cells, which may be stored, it is claimed, for an indefinite period in any climate without undergoing deterioration. The cell is rendered active by the addition of water. This form of cell offers a clear convenience.

EYESIGHT AND SHOOTING.

THE anxiety of the Germans about the good shooting of their army, their determination that all soldiers should have their errors of refraction corrected by "shooting spectacles," and that breakages, if they occurred, should be immediately replaced are well brought out by Major R. A. Fenton in the *Military Surgeon* (Washington, D.C., U.S.A.) for July. An "optical chest," holding 208 pairs of lenses and 84 empty spectacle frames, was carried by every division and even up into the front line. Men with uncommon defects had a duplicate pair of lenses supplied them before leaving Germany (the prescription was pasted into their pay books), and the medical officers of their units were responsible that these spare glasses were on the men or replaced. German ametropes wore special spectacles inside their gas masks, but Americans wore theirs outside. The German lenses were 38·2 mm. in diameter, the American 40 mm., which made a little awkwardness when the United States army captured German stores and wanted to use the spare lenses found in their own spectacle frames. The lenses were very often menisci to diminish distortion in the periphery of the field. The loss of useful service of soldiers whose spectacles were broken was considered at headquarters to be so important that replacements in the optical chest were demanded immediately by post and by post issued from headquarters in Germany directly. We have little doubt that our army had no such detailed arrangements for helping ametropes.

STERILISED HORSE SERUM.

THE treatment of anæmia by the internal administration of horse serum has been studied in France. The serum is also a hæmostatic agent applicable in external and internal hæmorrhage. Dr. Emile Weil has lately mentioned it in this connexion (THE LANCET, August 7th, p. 300). Hémostyl (L. Preud'Homme, 21, Rue d'Aumale, Paris) appears in three forms: (1) fluid in ampoules; (2) syrup; and (3) tablets. Samples have recently been submitted to us. It is stated that hémostyl is collected from young and healthy animals frequently bled, each drawing being carried out at a time when the horse is at the maximum point of blood regeneration. The treatment is based on the idea of "la rénovation sanguine." There is an extensive bibliography on the subject, published in Paris, Lille, Montpellier, Bordeaux, and elsewhere, and a paper by P. Carnot is quoted entitled, "Thérapeutique des syndromes hémorragiques" (Rapport au XIIIe Congrès français de Médecine, Octobre, 1912). The use of horse serum in sepsis is referred to also in an annotation in THE LANCET of June 12th, 1920, p. 1279. Samples of hémostyl may be obtained from Messrs. Wilcox, Jozeau, and Co., 49, Haymarket, London, S.W.1.

ROYAL EARLSWOOD INSTITUTION FOR MENTAL DEFECTIVES.

WE congratulate the board of management of this benevolent institution on its relief from financial embarrassment owing to a bounteous bequest from an old supporter, which will enable the clearing off of a bank overdraft amounting to £20,000, "contracted largely owing to the conditions prevailing during the great war," as well as the carrying out of much-needed improvements delayed through lack of funds. The seventy-third annual report of the institution, from which we take this gratifying information, shows that over 4000 cases have participated in the benefits of the establishment since its foundation in 1847, benefits not confined to the inmates themselves, but affording incalculable relief to families burdened with a mentally afflicted member. Earlswood has all along ministered to the needs of various social ranks and conditions, and now that public provision by local authorities and the State is to be made more largely under the Mental Deficiency Act the board of management contemplates an extension of the scope of usefulness of the institution to the needs of the professional and middle classes, impoverished as they are by present financial conditions, so as to entitle them to consideration in the scheme of charitable aid for mental defectives. Experience has shown that in the majority of cases permanent supervision is desirable, and the fact that more than half of the inmates of Earlswood are now over 20 years of age, and that 72 were on Dec. 31st, 1919, 45 years and upwards (three being over 75), shows that this desideratum has not been overlooked, though still capable of extension. At the same time, in order to secure the best results from training early admission is essential, and the proportion of those admitted last year under 14 years of age was 65 per cent., amongst them three infants under 5. From the report of the medical superintendent (Dr. Charles Caldecott) for 1919 we glean the following particulars. The aggregate of cases under care during the year numbered 522 (339 males, 183 females), and the average number in residence 446 (280 males, 166 females). Of 67 cases admitted, 11 were classed as idiots, 50 as imbeciles, 1 feeble-minded, and 1 moral imbecile. Eight were "Mongolians," 2 hydrocephalic, 9 epileptic, and 10 paralytic. Of 37 patients discharged, 30 were notified as "improved." Fifty deaths occurred during the year, 15 attributed to influenza, 13 to various forms of tuberculosis, and 4 to senility (the oldest aged 76). Post-mortem examinations were made in 34 cases. The death-rate, equivalent to 11·2 per cent. on the average number resident, is more than double that occurring in pre-war times, and Dr. Caldecott states that during the last three years there have been severe epidemics and unusual debility due, he thinks, to unfavourable war conditions, such as restrictions of diet and interference with normal lighting and ventilating arrangements necessitated by D.O.R.A. regulations. He considers, however, that, in view of the proportion of inmates normally requiring hospital care being at least 25 per cent., infirmary additions are called for, and he suggests balconies for open-air treatment.

The report contains interesting details as to the instruction of the patients, both at school and in a variety of useful indoor and outdoor industries. In such an institution there must needs be also much of medical interest, and we are glad to find that facilities for the clinical study of mental deficiency are afforded to students of metropolitan hospitals and post-graduate classes.

Dr. G. K. Audrey has been appointed chief assistant medical superintendent to the institution.

THE offices of the Director-General of Medical Services, Ministry of Pensions, have been transferred to the Crown Agents' Annexe, 5, Millbank, Westminster, London, S.W.1.

The Lumleian Lectures

ON THE

CLINICAL EXPERIENCES OF A PHYSICIAN DURING THE CAMPAIGN IN FRANCE AND FLANDERS, 1914-19.

Delivered before the Royal College of Physicians of London

BY SIR JOHN ROSE BRADFORD, K.C.M.G., C.B., M.D., F.R.S., F.R.C.P.

LECTURE II.*

JAUNDICE.

MR. PRESIDENT, FELLOWS OF THE COLLEGE, AND GENTLEMEN,—Several interesting clinical types of jaundice were seen, although these maladies never assumed in France and Flanders the proportions attained in the other seats of war, and no very large numbers of cases of jaundice of any type were seen at any period of the campaign. The most common type of jaundice seen was that usually diagnosed as so-called catarrhal jaundice, an ill-defined clinical group presenting considerable variations in its clinical symptoms; but, of course, a considerable number of cases of jaundice occurred as a complication of the more serious forms of the septic infection of wounds. In addition to these varieties, however, certain other distinct types were seen, one in association with infections of the enteric group, a second apparently connected with influenza, and a third the interesting form dependent upon spirochætal infection and now known as spirochætal jaundice. This malady is regarded by some as identical with the disease formerly described as Weil's disease, although probably not entitled to this name; by others the two affections are thought to be distinct and separate, as the clinical phenomena of the reported cases of the two maladies present some differences. Jaundice was seen as an occasional complication of other infections. Thus a very severe type was seen as a rare complication of pneumonia; but I wish more particularly to discuss the other varieties mentioned above. In addition to the forms of jaundice arising as the result of disease or as the sequel to wounds, a certain number of cases of toxic jaundice of a very severe type and very frequently fatal occurred as a complication in the treatment of syphilis with arsenical compounds.

Jaundice the Sequel of Wound Infection.

Two principal varieties of this form of jaundice were seen: firstly, the well-known jaundice accompanying severe streptococcal infections; and, secondly, that associated with infections dependent upon anaerobic bacilli. It cannot, however, be asserted that in the latter instances such anaerobic bacilli were the only organisms present. It would be more correct to speak of the streptococcal cases as free from the presence of gas-forming bacilli and the anaerobic cases as examples of mixed infection in which, however, the anaerobes were the important element.

Jaundice associated with streptococcal infections.—The jaundice associated with streptococcal infections was of very varying degrees of intensity—sometimes a mere icteric tinge, in others a jaundice of a very marked and bright yellow colour. Such cases, even when very severe and ultimately fatal, often ran a rather prolonged course, and, so far as my experience went, were not characterised either by the invariable association of severe nephritis or of marked hæmorrhagic complications with the jaundice. In these respects they presented a marked contrast to the cases of jaundice dependent upon anaerobic infections. These streptococcal cases then only showed the clinical picture of jaundice of varying degrees of intensity, although the mere presence of this complication greatly increased the gravity of the outlook.

Anaerobic jaundice.—The cases of anaerobic jaundice were much more remarkable in several respects and often presented problems of considerable difficulty from the clinical point of view. The onset and development of the jaundice in these cases were often extremely rapid and the depth of colour most remarkable; generally it was an extremely deep yellow, but sometimes it was definitely a deep orange greatly resembling that seen in spirochætal jaundice.

Some of the most marked examples of anaerobic jaundice were seen in cases where the anaerobic infection was not an immediate complication of the wound, but where it ensued after a latent period of varying length. Thus it might perhaps be best studied in cases of hæmothorax with anaerobic infection, but where this anaerobic infection either only developed some few days after the infliction of the wound, or, at any rate, where it only developed to a serious degree after such a period of latency. One of the most striking clinical features of this variety of jaundice is the extremely rapid development of the jaundice once it is present; thus one day the patient may present only a doubtful icteric tinge of the conjunctiva, but in some 24 hours the skin has become deep yellow or even orange in colour. Secondly, a considerable amount of nephritis is generally, if not invariably, associated with the icterus, and the urine contains not only much albumin but also casts, granular and hyaline. Thirdly, a purpuric condition develops early and more especially epistaxis and hæmatemesis. In the less severe cases the hæmatemesis is probably only dependent upon the vomiting of blood derived from epistaxis, but in the more severe cases true hæmatemesis may occur.

Although this variety of jaundice is always very formidable and often fatal, this is not so always if its true nature is at once recognised and prompt measures are taken to deal with the infection. In cases of gunshot wounds of the chest with hæmothorax the true nature of these cases is very apt to be overlooked. It is not always realised that the development of jaundice of this type is really proof that the hæmothorax is not a simple but an infected one, and that the infection is one due to anaerobes and calling for instant treatment. Such cases are apt to be misunderstood and the jaundice attributed to a supposed wound of the liver, the hæmothorax being regarded as merely part of a more serious lesion, whereas in reality it is the sole lesion. Such mistakes are especially prone to be made when the wound is in the lower chest and on the right side, but so many chest cases are seen where there is only an entry wound and the course and even the position of the foreign body are unknown that this error is by no means limited to cases where the wound of entry is in the hepatic region. It is very doubtful whether wounds of the liver ever cause jaundice unless the wound is infected, but there is no manner of doubt that chest wounds on the right side, where the liver can be shown on post-mortem examination to have been uninjured, may be complicated by the most intense jaundice if the hæmothorax present is infected with anaerobes and gas-forming organisms. This anaerobic jaundice presents considerable resemblances to the jaundice of the more severe forms of so-called Weil's disease, or more correctly of spirochætal jaundice, more especially in the depth of colour of the icterus, the degree of nephritis present, and the tendency to purpuric hæmorrhage; but so far as my experience went the conjunctival injection, herpes, and a certain peculiar muscular tenderness, all very characteristic features of spirochætal jaundice, are not found in anaerobic jaundice.

Jaundice as a Complication of Definite Infections.

Jaundice as a complication of certain definite and well-known infections was occasionally seen, but although this clinical variety occurred in such diseases as pneumonia, enteric fever, and in influenza, it was not a common complication, and in the cases of enteric fever, and especially in influenza, the diagnosis was often by no means certain.

Jaundice certainly occurred as a complication of pneumonia even when the causative organism was shown to be a pneumococcus. Usually it was not of a severe type; such patients might have a citron-coloured sputum and slight icterus, conjunctival and cutaneous. I only saw one case of intensive jaundice complicating pneumonia, and here the organism was a pneumococcus of Type II., and the case was fatal, with massive pneumonia involving the whole of the right lung. A few cases of jaundice of moderate severity were seen that were regarded as being in all probability of influenzal origin. These cases were characterised by the sudden onset of a febrile illness with a temperature of 102° or 103° F., intense headache, and general aching pains in the limbs. The pyrexia lasted only a few days, and its subsidence was often accompanied with much sweating, and was followed by the development of jaundice of moderate severity, the colour of the skin being a bright yellow, lasting some

* Lecture I. appeared in THE LANCET, Sept. 11th, 1920 (p. 535).

two to three weeks. Such cases had no splenic enlargement and no evidence of nephritis beyond in some cases a minute trace of albumin in the urine. They were regarded as possibly influenzal in origin as they showed no evidence of infection with either organisms of the enteric group or with spirochætes. Clinically they resembled cases of so-called catarrhal jaundice except that the symptoms at the onset were more severe and the febrile period more marked and prolonged than is usual with catarrhal jaundice. It is remarkable that such cases were not only seen when there was an undoubted epidemic of influenza prevalent, but also that they occurred at other times when such was not the case. It is, of course, quite possible that this variety of jaundice was in reality due to some other and possibly unknown infection. In the severe and undoubted outbreaks of influenza that occurred in 1918 and 1919 jaundice was not a common complication.

The relation of jaundice to the infection produced by the enteric group raises several difficult clinical problems that are not, perhaps, completely settled. In the first place jaundice was not often seen as a complication of undoubted cases of enteric fever; whether this was due to infection with the typhoid bacillus or with one or other of the paratyphoid organisms; and this is in harmony with the experience of civil practice, where such a complication is also admittedly rare. On the other hand, a certain number of cases of febrile jaundice with splenic enlargement as a leading feature of the illness were seen, and in some of these cases the pyrexia was often prolonged and of a type similar to that seen more especially in paratyphoid infections. Such cases also usually showed evidence of the presence of some nephritis, as the urine contained a small or moderate amount of albumin, always more than a mere trace.

In these cases the jaundice was very marked, sometimes intense and always an early feature of the illness, coming on within the first week of illness and not uncommonly so early as to be the first sign of the presence of illness. In other words, the jaundice was not a complication of an existing illness, but rather an early manifestation of such illness, and sometimes actually an initial manifestation. No fatal case fell under my observation, and thus post-mortem evidence of their nature is lacking; but bacteriological evidence was in some, but not in all, in favour of this variety of jaundice being due to infection with organisms of the paratyphoid group. This evidence was usually only that afforded by an agglutination test, and such evidence is not always really conclusive, as there are numerous possible fallacies and some technical difficulties.

The fact remains that there was a small group of cases of febrile jaundice with definite and sometimes considerable splenic enlargement and moderate albuminuria; that in such cases the jaundice was an early and prominent feature of the illness; and that in some, but not in all, there was some evidence that possibly such cases were due to infection with organisms of the enteric group, limiting their activities to infection of the biliary passages and not producing ordinary enteric fever. It is, however, by no means certain that all cases of this clinical type belonged to this group, and it may well be that there are other infections affecting primarily the biliary passages. Nothing comparable to the serious outbreaks of jaundice reported as due to paratyphoid infection that have been described as occurring in other fields of war—e.g., Gallipoli—occurred in France and Flanders.

SPIROCHÆTAL JAUNDICE.

Perhaps the most interesting variety of febrile jaundice seen in France was that dependent upon spirochætal infection. There is some confusion in nomenclature with reference to this disease owing to the doubt whether these cases are the same type as the disease formerly described under the name of Weil's disease. There are considerable clinical resemblances between the two maladies, but also some differences, more especially in regard to the condition of the spleen, enlargement being stated to be much more frequent and characteristic of the one than of the other. The malady to which Weil's work directed attention was known as one liable to occur in armies, and hence from the earliest period of the campaign watch was kept for any cases of jaundice of doubtful origin; but the first case I saw of this disease occurred in a Canadian in December, 1915. A moderate number of cases came under observation in 1916, and in the subsequent years, 1917 and 1918, a smaller number was seen. The clinical picture presented by a severe case is so distinct and characteristic that the malady can scarcely be overlooked by anyone familiar with it; but in the slighter forms this is not the case, and it may then not only be readily confounded with some of the more severe forms of so-called catarrhal jaundice, but even with quite mild forms of the latter disease.

Distinctive Features.

There are many distinctive features in spirochætal jaundice, but they do not demand more than short mention here, as several descriptions of the malady have now appeared in medical literature.

In cases of moderate severity the disease is of sudden onset, with considerable pyrexia, the temperature rising to 102° or 103° F., or more, the fever lasting generally about ten days, sometimes more, and in slight cases sometimes less, and then returning rather suddenly to the normal, but without a distinct crisis. A most characteristic feature of the temperature chart is the occurrence of a secondary rise of temperature or relapse lasting only two to four days, and taking place within a week of the subsidence of the initial pyrexia. This secondary rise is not always present, and may be absent in the cases of the greatest severity that are fatal, as is not infrequently the case in the earlier stages of the illness. It is, however, not uncommon in quite mild cases, and affords one of the means of distinguishing these mild cases of spirochætal jaundice from similar mild cases of so-called catarrhal jaundice. The jaundice is remarkable for its great intensity in the severe cases and for the frequency with which it is of a deep orange colour, a depth and variety of colour that was not familiar to me in civil practice. With the subsidence of the pyrexia the jaundice begins to diminish, and it is of interest that the relapse with the recrudescence of fever is not accompanied with any corresponding increase in the jaundice.

Another extremely characteristic feature of the illness, but perhaps not present in all cases, is not only the occurrence of severe muscular pains during the earlier periods of the pyrexia, but also the presence of very considerable muscular tenderness.

This tenderness of the muscles is especially marked in the muscles of the thighs and of the abdominal walls, but sometimes it is more widespread and may affect also the arms. The pain in, and especially the tenderness of, the abdominal recti and of the thigh muscles was not uncommonly so great as to require cradles to keep off the pressure of the bedclothes. This muscular tenderness was not limited to the severe and fatal cases; it may be quite marked in cases of very moderate severity, and again affords a useful diagnostic criterion. I know of no other variety of jaundice where such a phenomenon as this is present. Although no gross changes are obvious clinically to account for the extreme muscular tenderness, examination of the muscles from a fatal case, in the first instance by Captain Pringle, R.A.M.C., and subsequently in several other fatal cases by Captain E. F. Bashford, R.A.M.C., revealed the presence of very distinct lesions both degenerative of the muscle fibres and interstitial, the latter of an inflammatory nature with hæmorrhages. The details of this muscular lesion will, it is hoped, be published later. This muscular lesion, both clinically and pathologically, is a very characteristic feature of the malady, and is certainly usually, if not invariably, present. It is a useful clinical sign both in severe and in mild cases. In the former it may assist in differentiating between jaundice dependent upon spirochætal infection and that seen after salvarsan and similar compounds. In mild cases it may assist in differentiating between spirochætal and catarrhal jaundice. Similar muscular lesions are present in the guinea-pig after inoculation with the blood derived from human cases during the early pyrexial period. It is curious that the symptoms caused by the muscular lesions in spirochætal jaundice should be so severe, since the much more obvious muscular lesions occurring occasionally in other infections—e.g., influenza, enteric fever—are often not associated with very marked clinical symptoms.

Purpura in some form is another characteristic feature of the spirochætal jaundice; the purpuric eruption on the skin is often scanty and the spots small, but other purpuric phenomena are common.

Thus an outbreak of labial herpes rapidly becoming hæmorrhagic is of very frequent occurrence and bleeding from the gums is common, leading to the presence of masses of decomposing blood clot encrusting the teeth. Epistaxis is also very common and severe hæmatemesis is often the immediate cause of death. Hæmatemesis may be scanty and repeated, but several instances were seen where the first hæmatemesis was of large amount and either rapidly or even immediately fatal. In a few instances such fatal hæmorrhage occurred in cases where up to the time of its occurrence there had been no symptoms that seemed to warrant such a grave prognosis.

Nephritis is a very constant accompaniment of spirochætal jaundice, and the amount of albumin present is usually considerable and may be large.

In the mild cases the albuminuria is often transitory in duration, lasting only a very few days, whereas the jaundice, even in the mild cases, may last three to four weeks. The nephritis is not accompanied by dropsy so far as my experience went, even when it was of a very severe type, but the urine may become very scanty or the secretion even may be suppressed. In the cases where purpura is marked profuse hæmaturia may be present similar to that seen in the most severe forms of purpura hæmorrhagica, and such cases may also suffer from hæmorrhage from the bowel and from hæmoptysis. It is difficult to say to what extent the severe and fatal cases suffer from uræmia, but such patients become very prostrate, lethargic, and apathetic, and may be partially or even completely unconscious, with a subnormal temperature for several days before death. It is difficult if not impossible to say how far these symptoms are uræmic and how far they are cholæmic in origin.

Another remarkable feature of the disease is the frequency of pulmonary lesions and of pulmonary complications, more especially areas of lobular pneumonia with the expectoration of a sanguinolent sputum.

On post-mortem examination areas, often of some size, of imperfect consolidation, together with extreme congestion and hæmorrhagic infiltration, are found and are very characteristic features of the morbid anatomy of the disease. Herpes (labial) and purpura are not the only rashes seen. Sometimes there is a most remarkable roseolous rash, each spot being one-third of an inch in diameter and of an intense bright red colour and distributed all over the trunk and limbs. The appearance of the patient is most striking owing to the contrast of the bright red rash on the background of deep orange jaundice. Such rashes have not apparently any grave prognostic significance.

The conjunctival congestion that is seen in the earlier stages of the disease is also a very characteristic clinical sign.

The clinical features of a severe and especially of a fatal case of spirochætal jaundice are then very marked and characteristic. A febrile onset with marked muscular pains and local muscular tenderness, intense jaundice often orange in hue, herpes labialis, and especially hæmorrhagic herpes affecting the lips and face, purpura, possibly markedly hæmorrhagic in character, nephritis and great prostration, together with much vomiting—all these form a very definite and characteristic clinical picture not presenting any very close resemblance to other diseases met with in temperate climes.

Diagnosis.

The diagnosis of well-marked cases is therefore not usually difficult, although sometimes it may not be easy to exclude at once the possibility of the presence of one of the more severe forms of toxic jaundice such as that due to salvarsan, or that due to phosphorus, and I have seen one case of spirochætal jaundice where the extreme congestion and hæmorrhagic condition of the mucous membrane of the stomach was quite comparable to that seen in phosphorus poisoning. It is sometimes possible to detect the spirochæte in human cases by direct examination of the blood, but a much more reliable method is to inoculate a guinea-pig with a small quantity of blood from the suspected case during the febrile period of the illness and before the eighth day of the disease. The spirochæte can be found with far greater ease in the experimental animal after the reproduction in it of the disease. Further, the spirochæte can be recovered from the urine in the human subject during a prolonged period in marked contrast to what obtains in the blood, as there it can only be found in the earlier days of the disease. The detection and recovery of the spirochæte from the urine present, however, certain technical difficulties that need not be considered here as they are dealt with in the papers by several authors describing this disease and its diagnosis. Whilst there is no great difficulty in recognising the more severe forms of the disease, there can be but little doubt that a certain, and perhaps a considerable, number of cases are looked upon as merely cases of so-called catarrhal jaundice.

In these milder cases the febrile onset is of less severity and the fever persists for a few days only, so that not infrequently the jaundice is not noticed until the pyrexia has disappeared. In this respect these cases resemble not only cases of catarrhal jaundice, but also cases of post-influenzal jaundice, and the resemblance to this latter disease may be still greater owing to the presence of limb pains in both of them. The jaundice in the mild cases may only be of moderate intensity, although even in these it is usually more marked than in the average case of catarrhal jaundice. The nephritis also may be slight and transitory, so that clinically it may be impossible to distinguish these mild cases from catarrhal jaundice unless the observer is fortunate enough to see the case in the first week of illness or whilst pyrexia is still present. Then by inoculating a guinea-pig with blood from the patient the spirochæte can be recovered, even in cases of very slight severity, and their true nature established.

There are two clinical points that may be of assistance in the diagnosis of even these mild cases, and are sometimes sufficient to separate these cases from catarrhal jaundice—i.e., the presence of the muscular tenderness and the occurrence of the febrile relapse. Both these phenomena may occur in quite slight cases of spirochætal jaundice. The difficulty in the diagnosis of these slight cases must necessarily be considerable, because the organism can only be recovered from the blood in the early stages, and as at this stage jaundice may be absent the full examination of the blood is not made, as the malady is not suspected. Hence the pyrexia, particularly as it is transitory, is attributed to some such cause as supposed influenza, and then when the jaundice supervenes it may be too late to detect the spirochæte in the blood.

How many cases of supposed catarrhal jaundice or of post-influenzal jaundice are really of spirochætal origin I am unable to say, but I am inclined to think that in all probability it is appreciable, as we recovered the spirochæte from the blood in several cases indistinguishable from catarrhal jaundice in the trivial character of the illness, but here we were fortunate in seeing the patient early in the illness. Nevertheless, in many cases we failed. Doubtless catarrhal jaundice is not a definite clinical entity; rather it includes probably a number of conditions of different nature and of different origin—some of cholangitis, some of duodenitis, possibly some of pancreatitis, although perhaps cholangitis of some kind is answerable for the majority of cases. Further, it would seem that at present we do not know the real causation of the bulk of cases of catarrhal jaundice. From its clinical course it would seem to be an infection, but no causative organism has as yet been found, and no spirochæte has been found in the great majority of cases examined. Further, although there is a general resemblance in the clinical picture of all cases of catarrhal jaundice, yet there are individual differences that are very difficult to understand. Are these dependent upon a mere variation in the intensity of the lesion, or are they due to quite different and separate varieties due to different causes? Thus all observers would agree that some cases, indistinguishable at the outset from ordinary mild catarrhal jaundice, after a few days' illness suddenly run a totally different and rapidly fatal course, with the sudden rapid development of dangerous symptoms such as hæmatemesis or cholæmia. The observations made in France showed that such cases might be spirochætal in nature and, further, that all mild cases of spirochætal origin did not necessarily follow such a course.

Thus, in so far as spirochætal jaundice is concerned, it it would seem that profound differences in clinical type were still consonant with one and the same cause, and did not necessarily indicate different ætiology. There are, however, differences seen in any large series of cases of catarrhal jaundice that are difficult of explanation as merely the result of differences in the severity of the infection. To mention only two, the incidence of nephritis in catarrhal jaundice and the presence or absence of splenic enlargement. So far as my experience goes in the observation of considerable numbers of cases of catarrhal jaundice, the severity of the illness and the degree of jaundice can certainly not be correlated with the degree of albuminuria present or with the presence of splenic enlargement. Some cases of so-called catarrhal jaundice have marked enlargement of the spleen and some had considerable albuminuria; others did not, and this could not be correlated either with the severity of the illness or with the presence of some definite infection such as a spirochæte or organisms of the enteric group. The fact that some cases of mild simple catarrhal jaundice yielded under favourable conditions evidence of the presence in the blood of a spirochæte suggests that this group of cases is not a single clinical entity and that probably many owe their origin to some unknown specific agent.

NEPHRITIS.

The study of this disease during the war has yielded some facts of interest both from the point of view of ætiology and of clinical medicine, and it affords a striking example, showing how the clinical phenomena

of a thoroughly well-known malady may apparently be different to those usually described when the disease is seen on a large scale and under conditions different to those we were accustomed to. All physicians very soon realised that the clinical phenomena of nephritis as seen in France were somewhat different to those familiar to them in civil practice. Some attributed this to the supposed occurrence of a new disease and so labelled it "trench nephritis," now modified to "war nephritis." Others were not so confident that the differences, such as they were, might not be more correctly attributed to the different conditions under which the disease occurred.

In my first lecture I drew attention, in discussing acute rheumatism, to the efficiency with which the medical examination of the troops had been carried out in this country prior to their departure overseas and to the rarity with which organic diseases such as valvular disease of the heart were met with. The same is true of other chronic or latent diseases, and the rarity of chronic renal disease in the original Expeditionary Force and in the subsequent armies sent over to France was very striking.

The Small Contracted White Kidney.

Thus cases of such an insidious malady as chronic nephritis in its various forms were quite infrequent, although a few examples of that remarkable condition, the small contracted white kidney of young adults, were seen.

It is a very extraordinary fact that men suffering from such a lesion as this should have been able to withstand even for a time the hardships, fatigue, and rigours of the campaign. Several instances of this disease were met with, precisely similar in their clinical course to those seen in civil life, in that the patient only reported sick with the onset of the terminal uræmic manifestations. In one such case the man had gone through all the hardships and fatigue of the earliest stage of the campaign and had fought through the first battle of Ypres, yet he suffered from the typical form of the disease, dying from acute fulminating uræmia, and the kidneys together weighed little over three ounces.

Several similar instances of this condition were seen throughout the campaign, and in all cases death resulted from acute uræmia.

The Occurrence of Nephritis in the Spring of 1915.

These cases of chronic renal disease, although of interest, were so few in number that they were of little importance and no appreciable number of cases of nephritis occurred until the spring of 1915. This is the first fact of interest with reference to this disease because the autumn of 1914 was cold and very wet and the troops suffered greatly from hardships of various kinds, associated with the heavy fighting of the period and the great exposure of the men in the earliest days of trench warfare. They also suffered much from fatigue owing to their long periods of stay in the trenches and the paucity of reliefs. Nevertheless, nephritis practically did not exist. In March and April, with the advent of spring, cases of nephritis suddenly became more common, and in a short time it became obvious that the cases were occurring in considerable numbers, although at no time were the numbers such as to cause anxiety from a military point of view. It may be of interest to recall that about this time what was subsequently known as trench fever first began to attract attention. The first cases of nephritis that came under my observation occurred in March, 1915, and the first cases of pyrexia of an unknown type, subsequently recognised as trench fever, in May, 1915. Trench fever is a disease that might be readily overlooked or confounded with other maladies, but this is not so with nephritis, and there can be little doubt that the malady was not prevalent until the spring of 1915.

The disease affected all branches of the Service, men in the fighting line belonging to all arms, men on the lines of communication, and, what is especially important to note, men such as hospital orderlies who had never left their base hospital. Thus, one hospital unit in Boulogne had four cases at one and the same time amongst their orderlies, men who on leaving England had been nowhere in France except their hospital, a building in the town of Boulogne. Emphasis is laid on these facts because it was only in the early years of the war that such facts could be elicited; later on men were moved about to such an extent that no such observation as the above was possible. Whilst men belonging to all branches of the Service were affected, the number of officers affected was extraordinarily small, and this was true for the whole campaign. A few cases occurred in women, more especially in nurses.

Immunity of Indians.

The most remarkable fact, however, is that the disease did not occur in the Indian native troops. The large Indian native hospitals, with a total of several thousand beds, were in the area of my work and I paid them constant visits. I saw no case of nephritis and I was informed that only three cases of nephritis had been returned from the whole Indian contingent, and this included one of obvious chronic disease in a native officer some 42 years of age. Thus, at a time when the disease was increasingly prevalent in the British troops it did not occur in the Indian troops.

Although the Indians did not suffer from nephritis, nevertheless they suffered greviously from other diseases attributable to exposure. Bronchitis and pneumonia of various types were extremely common and also of considerable severity, and large wards were entirely filled with such cases. This immunity of Indian troops to nephritis is a striking example of the complexity of the problem of the causation of this disease. Approximately 10 per cent. of the cases of nephritis yielded a history of some antecedent illness, such as a severe cold, diarrhœa, influenza, or sore throat, and doubtless the percentage was really higher as such antecedent illness is often slight and overlooked by the patient. On the other hand, a considerable number of patients, 30 per cent. in a series of 278 cases, either gave a history or had distinct signs of bronchitis when admitted to hospital. Were it not for the fact that the Indians suffered from bronchitis to a very serious degree, but did not develop nephritis, it might be concluded that the frequency of such respiratory affections was an ætiological factor of some importance in the production of the disease.

It is important to realise that the respiratory affection was present in cases of primary nephritis—that is to say, in patients admitted to hospital on account of the renal lesion, and not on account of the bronchitis. Stress is laid on this point, because during the winter of 1916–1917 the nephritis statistics of the army were swollen by the inclusion of large numbers of cases of secondary nephritis, where the renal lesion was merely a complication of severe bronchitis and of lobular or broncho-pneumonia—both of these diseases were prevalent and very severe at that time. Although nephritis was present in these patients and was a common lesion in the fatal cases, such cases do not belong to the same group as those of primary nephritis, and the clinical effects are quite different. Thus this secondary nephritis is mainly characterised by the excretion of scanty urine, with a variable but usually small quantity of albumin. The inclusion of these cases of secondary nephritis also vitiated the mortality statistics, inasmuch as these patients had a high mortality dependent upon the severe character of the primary respiratory disease. In the cases of true or primary nephritis a history could be obtained in some 10 per cent. of the patients of their having suffered at some previous time from a similar attack or that they had been under treatment for "inflammation of the kidneys" or for "Bright's disease."

It is probable, therefore, that in at least 10 per cent. of the cases the patients had suffered from a previous attack of nephritis; this result was obtained from personal investigation of a series of 571 cases. It is difficult to determine what proportion of the patients apparently suffering from primary acute nephritis were in reality suffering from an acute exacerbation of a chronic lesion. That this was so in a certain proportion of cases is evident from the post-mortem findings, as it was not uncommon to find distinct and unequivocal evidence of old-standing lesions in cases where on clinical grounds the malady had been regarded as acute. In a series of 149 cases personally examined a markedly raised blood pressure and apparent hardening of the radial artery were present in 27 per cent.; but it is quite certain that these phenomena were not in all cases evidence of the existence of chronic disease, as such changes may occur quite rapidly as the result of primary acute nephritis. It is, at any rate, certain that the bulk of the cases of true nephritis occurred in men that had not suffered from previous renal disease, and, further, that the nephritis was not constantly the sequel of any severe immediately antecedent illness. On the other hand, a considerable proportion of the cases yielded evidence of having suffered from a trivial illness or presented slight signs of such illness, more especially in, but not limited to, the respiratory tract.

The Influence of Age on Ætiology.

The study of nephritis in the army afforded an opportunity of determining the influence of age in the ætiology of the disease, and 2297 cases were analysed

from this point of view in 1915–1916. These were all cases of primary nephritis, 50·2 per cent. of the cases occurred in men under 30 years, 72·7 per cent. in men under 35 years of age, 15·5 per cent. in men between 35 and 40 years, and 11·8 per cent. in men over 40 years of age. It is therefore clear that the disease is by no means limited in its incidence to the older men, as more than 25 per cent. of the cases occurred in men under 25 years and nearly 75 per cent. in men under 35 years of age.

Colonel Hume has published some statistics of the ages of a body of 3000 hospital patients, from which it would appear that 78 per cent. of these men were under 35 years of age, figures closely resembling the above nephritis results.

Features of Clinical Interest.

Clinically the cases presented many features of interest, and their study may perhaps lead to the modification of some of our conceptions of this disease, and more especially perhaps our views as to the gravity of nephritis. The onset of the disease might be either gradual or apparently sudden, and when sudden the earliest symptoms might be dyspnœa, either nocturnal or produced by exertion—e.g., on the march, dropsy, or pyrexia with hæmaturia. Some of the cases of sudden onset with dropsy also had slight pyrexia, but in all febrile cases the fever was slight and of short duration.

There is a remarkable group of cases to which I alluded in a first paper in the *Quarterly Journal of Medicine*, vol. ix., January, 1916, characterised by rather profuse hæmaturia and pyrexia with no dropsy. The curious feature of these cases first seen in the spring of 1915, and then later throughout the campaign, was the fact that after the subsidence of the initial pyrexia recurrences of pyrexia consisting of a single spike on the chart, and lasting only a few hours and accompanied with hæmaturia, would take place. The temporary character of the fever and the sudden hæmaturia were very similar to that seen in cases of renal embolism. The charts presented considerable resemblance to those subsequently described in one form of trench fever, but there does not seem to be any sufficient ground for regarding these cases of nephritis as really associated with trench fever. These cases of hæmorrhagic nephritis were on the whole uncommon, and formed only a small proportion of the total cases. It was exceptional for dropsy to occur, and the prognosis was good as they generally cleared up in a short time. In the more common variety of the disease pyrexia was either absent or was only present to a slight degree in the earliest stages of the malady. Clinically dyspnœa was a leading feature of the illness and dropsy of the usual renal type was common. A most striking feature of the majority of the dropsical cases was the rapidity with which it subsided, although in any large series of cases some were seen of the type so familiar in civil hospitals where the dropsy was refractory to treatment and persisted. This rapid subsidence of considerable anasarca was certainly a novel experience to most observers familiar with renal dropsy as seen in London hospitals. In many cases where the anasarca was considerable on admission it had disappeared within a fortnight, and in slighter cases its duration was only a few days. Uræmic manifestations in the form of epileptiform fits were not uncommon, and such fits might be repeated and of great severity; nevertheless, they were rarely fatal. Other uræmic phenomena were uncommon. Inflammatory complications were uncommon, and the mortality from the disease, at any rate during its early stages, was very low. In a considerable series of cases personally examined in 1915 it was as low as 0·4 per cent. In a larger series for the year 1916 it was 0·93 per cent., and in 1917, when, as mentioned above, the statistics included cases of secondary nephritis complicating acute respiratory affections, and where death was at any rate partly dependent upon the respiratory disease, the rate was as high as 1·32 per cent.

The clinical study of these cases should make us revise some of our conceptions of renal disease and would seem to suggest that the clinical picture of the malady as we usually see it in civil hospitals is really the picture of certain more severe and unfavourable cases. Cases quite similar to these were seen amongst the large numbers of cases seen in the army, but the broad fact remains that the great majority of cases of acute nephritis, even when dropsy was considerable, or when severe epileptiform fits occurred, not only cleared up, but cleared up very rapidly. The fact seems to be that service in the army compelled a man with nephritis to seek medical advice at an earlier stage than is the case in civil life or when the illness was only slight, and thus we had the opportunity of obtaining a more correct impression of the features of the disease, besides that of seeing very large numbers of cases, amounting in some instances to several thousand. It would seem that this is really a more satisfactory explanation of such differences as were found than to assume that the disease was a special and peculiar one to the army.

ACUTE INFECTIVE POLYNEURITIS.

Amongst the rarer forms of disease seen in France there was a group of cases of generalised palsy of a peculiar type but with very constant and uniform features and similar in character to certain cases described by Osler under the term of acute febrile polyneuritis. Isolated cases were seen from time to time during the earlier periods of the war, but a more considerable number was seen in 1917 and a few in 1918.

Onset.

Two modes of onset may be recognised. In one there is a definite history of an illness, usually of a slight character, prior to the onset of the palsy; in the other the onset of the palsy is the first manifestation of the disease. It is probable that the first mode of onset should be regarded as the more typical.

Usually the initial illness is of a mild character and moderate pyrexia, headache, vomiting, pain in the back and along the spine, together with some pain in the limbs and possibly in the abdominal wall, are the leading symptoms. The headache may be severe, and in a small proportion of cases the severity of the headache, vomiting, and pain in the back are such as to resemble the early symptoms of cerebro-spinal fever. The pyrexia is of short duration, lasting two to four days and rising usually to 100° to 101° F. Exceptionally a temperature as high as 103° has been observed. All the symptoms subside rapidly and the patient apparently regains his former health, and thus such cases are often regarded as being due to influenza or to pyrexia of uncertain origin. A period of latency now occurs which may last for as long as six weeks from the date of the onset of the initial illness and then the palsy becomes manifest. In other cases this period of latency is much shorter, and this would seem to be more especially the case in those instances where the initial symptoms were so severe as to resemble those of cerebro-spinal fever.

The Palsy.

In the less severe cases the onset of the palsy is noticed only as a general weakness that increases more or less rapidly.

In the more severe cases the onset of the palsy is more dramatic; thus a man may suddenly fall down on parade or on the march, and in one case under observation at the time, the patient sat down to his midday meal apparently well and was unable to rise. Even when the onset is as sudden and marked as this there is not complete paraplegia and the patient can often stand and sometimes even walk with assistance.

Numbness and tingling in the extremities may precede or accompany the onset of palsy, and pain in the back, limbs, and body may also occur at this time. Usually the palsy affects at first the legs and may be confined to them. The legs are affected as a whole, and no case has been seen where the palsy was limited to the distal segments of the limb nor where it was limited to one limb. In some cases where the patient only complains of weakness of the legs, examination reveals that the arms are also affected, but in many cases there is a distinct interval between the date of the onset of the leg palsy and that of involvement of the arms, and this interval may be as much as three days. A marked feature of the palsy is the greater involvement of the proximal portion of the limbs, so that the movements of the shoulder and hip muscles may be extremely weak at a time when the patient can move the fingers or toes freely. Similarly, the trunk movements are frequently affected, so that the patient is unable to raise himself in bed, sit up, and may be unable to turn in bed or even to raise his head from the pillow. When the trunk muscles are involved the patient's condition is necessarily very serious, and death may occur as a result of involvement of the muscles of respiration. Nevertheless, some cases recovered even when the helpless state produced by the palsy of the trunk muscles persisted for several weeks. Cases in which the palsy is widespread, involving trunk and limbs, but not severe in amount, are very apt to be overlooked and classed as functional or neurasthenic, or even suspected of malingering. Such cases may, however, really be very serious and even fatal, as not infrequently such palsy may increase rapidly and suddenly, and death has occurred in more than one case where 24 or 48 hours before no suspicion of the presence of grave organic disease had been entertained.

Facial paralysis is a most characteristic feature of the malady, and it is probably exceptional for it to be absent, although it may escape observation unless specially looked for.

This arises from the fact that the palsy is so frequently bilateral, and also it is rather a general weakness of all the face muscles than a complete palsy, hence there is frequently no asymmetry of the face. In a series of 20 cases with full records facial palsy is noted in 17 cases; in two no record is made, and in only one is there a definite note that facial palsy was not present at the time of examination. In five cases the facial palsy was unilateral when first observed, and in two of these it became bilateral; in 12 cases it was bilateral when the patient was first seen. Thus in 14 out of 17 cases the facial palsy was bilateral at some period of the illness. The onset of this palsy is often distinctly later than that of the limbs and trunk, and the interval may be as long as four days. The peculiar palsy described above as affecting the limbs, trunk, and face, and sometimes of an ascending type, is the most characteristic feature of the disease, but other palsies may occur. Thus difficulty in swallowing, especially of solids, may occur and in slight degree is not uncommon; palsy of the palate, however, is not common, and the nasal voice and difficulty in the swallowing of liquid such as is seen in diphtheric paralysis is uncommon. The larynx and tongue may be involved, and in one case the symptoms so produced were sufficiently marked for a diagnosis of labio-glosso-laryngeal paralysis to have been made prior to the admission of the patient to hospital. Paralysis affecting the oculomotor nerves must be rare, as the only nerve affected in a series of over 30 cases was the sixth nerve, and this only in one case. No instance of palsy of the third or fourth nerve was seen, and thus ptosis was never observed.

Pain, numbness and tingling, anæsthesia and analgesia are usually present. The sensory loss is usually incomplete, relative rather than absolute, and affecting especially the distal segments of the limbs; its distribution may be of the glove or stocking type. Remissions in the extent of the sensory loss may occur, and the boundary line separating on a limb the normal area from that in which sensation is impaired may vary in position in one and the same case on different days.

Reflexes, Sphincters, and Cerebral Functions.

The tendon reflexes are absent in fully established cases, but in the early stages the knee-jerks may still be present at a time when the weakness of the legs is obvious; and in cases of the ascending type the ankle-jerks may be lost at a period when the knee-jerks are still present, although these also are lost later. The plantar reflex is usually lost, but the abdominal and cremasteric reflexes may be retained where the involvement of the trunk is not very marked. When the trunk is more involved the abdominal reflexes are lost. The pupil reflexes and the palatal reflex are not affected.

Sphincters are not usually affected, and even in the most severe and fatal cases the functions of micturition and defæcation may remain normal to the end. Defæcation may be rendered difficult owing to the weakness of the abdominal muscles, and in the early stages of the palsy there may be slight temporary retention of urine, requiring, perhaps, the use of the catheter once or twice. No case requiring continuous catheterisation was observed.

No case with stupor, delirium, or convulsions was observed, and consciousness was always retained even in fatal cases right up to the moment of death; and it was not uncommon for death to be sudden. In one case the patient was certainly inclined to sleep unduly, but he could always be easily roused, and then answered all questions quickly and intelligently. In one case there was some loss of taste and some slight impairment of vision, and examination revealed the presence of a central scotoma. Tachycardia may be a prominent feature and was sometimes the cause of serious errors of diagnosis, as the case was apt to be regarded as one of D.A.H. with neurasthenia. I know of two cases at least where death occurred suddenly in such cases. The urine may contain a small quantity of albumin and the blood shows the presence of moderate leucocytosis; the cerebro-spinal fluid is clear, limpid, and free from cells.

The mortality of the disease is high—8 deaths in a series of 30 cases personally observed. Half the deaths occurred within a week of the onset of the palsy and only one death after the eleventh day. In half of the fatal cases death was due to pulmonary complications; in the remaining cases death was more sudden and, although possibly dependent upon respiratory failure, it was not accompanied with gross pulmonary lesions.

In the cases where recovery took place the improvement in the palsy was slow and gradual, and a period as long as six months may be necessary for the patient to regain his usual health. The palsy is not followed by muscular wasting.

Remarks.

Such is a short summary of the clinical picture presented by acute infective polyneuritis. It would seem that the disease is a very definite clinical entity, although both on clinical grounds and from the results of the study of the morbid anatomy it is probable that it is not a neuritis but really a diffuse affection of the nervous system affecting both nerve cells and nerve fibres in the spinal cord, spinal ganglia, peripheral nerves, and to a slight degree the cerebral cortex. It probably has affinities both to poliomyelitis and to encephalitic lethargica, and possibly to other varieties of encephalitis; but one of the most remarkable features of the campaign is that although a fair number of cases of this disease was seen, poliomyelitis was very rare, and I saw no case of encephalitis lethargica until the spring of 1919.

DIURNAL VARIATIONS IN THE HÆMOGLOBIN CONTENT OF THE BLOOD.

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THE necessity of paying due attention to daily variations in arriving at figures for the normal hæmoglobin content of the blood, a knowledge absolutely essential for the investigation of the blood under physiological and pathological conditions, has already been emphasised by one of us (G. D., 1919). In the same publication it was also pointed out how important it is to examine the person's blood at the time of the day when the smallest daily variations are exhibited—e.g., late afternoon—in order to arrive at a true estimate of normality (cf. Douglas, J. S. C., 1913).

On searching in the literature one is at once struck by the fact that the normal diurnal variations in the hæmoglobin percentage have hardly received any attention. In the paper by Douglas, Haldane, Henderson, and Schneider (1913) the subject is definitely considered and some actual figures are given. These workers record observations made four or five times during the working day, and they noticed in some cases the existence of definite differences. They seem, however, not to have laid any great stress on these changes in discussing their results, nor did they find these changes with any constancy. Indirectly the subject has been approached in the remarkably careful and long series of observations of Lloyd Jones (1887) on the diurnal changes in the specific gravity of the blood. This author pointed out the existence of definite daily variations of the specific gravity, and found usually the highest specific gravity about 9 to 10 A.M., and the lowest between 6 and 7 P.M. In view of our own experiments there seems no doubt that these changes in specific gravity are to a great extent caused by differences in the hæmoglobin content, and it is interesting to note that the times of the day when he finds his highest and lowest specific gravities coincide closely with those where we find the highest and lowest hæmoglobin content.

While what we call normal daily variations of the hæmoglobin percentage have thus been left unconsidered, as of no consequence, a number of observers have investigated the changes in the hæmoglobin or red-cell content caused by exercise (Tornow, 1895; Willebrand, 1903; Hawk, 1904; and Boothby and Berry,

1915), fluid intake (Haldane and Priestley, 1916), the position of the body (Jörgensen, 1917), and so forth. Changes in position are stated to have no effect on the red-cell content, though a marked one on the number of white corpuscles, but most observers have found that violent exercise results in a concentration of the blood. It seems, however, hardly possible to form an accurate opinion of the actual changes taking place unless the diurnal variations are duly considered. In fact, some findings in the literature regarding changes in the hæmoglobin percentage seem to be most naturally explained as due to these diurnal variations. The subject here dealt with has been under investigation for several years in connexion with various researches by G. D. and his co-workers, though the only hitherto published figures are those contained in the paper by one of us (H. C. B., 1919), in which one curve was given for comparison with pathological cases.

Method Employed.

The technique used has been developed by one of us (G. D.), and has been used in the Department of Pathology at Oxford for all work dealing with the blood and hæmoglobin for the last 10 years. As no accurate description has so far been published we shall give shortly the details of the procedure. Its advantage is accuracy combined with entire absence of knowledge of the results while readings are being taken, thus entirely excluding personal bias.

Measuring pipettes.—The pipettes used are capillary pipettes drawn from glass tubing of about 6 mm. diameter. It is drawn out to form a capillary tube of such proportions that a length of about 15 cm. corresponds to a volume of 0·1 c.cm. The end of the pipette is cut off sharply and squarely, and it is then graduated by means of mercury measured out from an accurately standardised 0·1 c.cm. pipette. The 0·1 c.cm. of mercury is thus used to graduate a large number of pipettes, which are thrown away after the blood has been measured. For taking the quantity of saline required for the dilution of the blood a 20 c.cm. pipette is employed, in which each cubic centimetre is graduated in 1/10ths.

The blood sample.—If the sample be taken from a finger it is absolutely essential that the capillary circulation should be free and normal, and not restricted as the result of cold or congestion, which produce readings above those obtained from venous samples (cf., Gibson, 1909). No squeezing should be allowed, and the blood should drop freely and have a natural bright colour. Only when this is done is it possible with any degree of certainty to obtain identical results when capillary blood is compared with blood drawn directly from a vein. Five or six drops are now collected into a freshly paraffined watch-glass and the dilution made immediately. While drawing up the blood into the capillary pipette it is necessary to agitate the watch-glass gently and continuously to prevent sedimentation of red cells, which takes place very quickly, and if this point is disregarded very considerable error will be introduced, while otherwise dilutions made from the same drop will give exactly identical readings. In the case of human bloods a dilution of 1 in 200—e.g., 0·1 c.cm. of blood in 19·9 c.cm. of normal saline—is convenient, while in the case of goats and rabbits a dilution of 1 in 150 is preferable owing to their lower hæmoglobin content. Immediately after dilution the blood suspension is carefully mixed, and the tubes with diluted blood are then left in the cold store (or a cool place) and are not hæmolysed until immediately before they are read. As the hæmolytic agent, dry saponin is added (about as much as can be taken up by the terminal millimetre of a penknife). The tubes are then gently rotated and left in a warm room, or preferably in a water-bath at about 30° C., for a few minutes until complete hæmolysis of the red cells has taken place. Before taking readings one should ascertain that the hæmoglobin solution is perfectly clear. The non-hæmolysed diluted red cells can with safety be kept in the cold store at a few degrees centigrade for 24 to 48 hours without showing any change, while the hæmolysed blood kept under the same conditions shows a definite drop in the hæmoglobin content within the same time.

The taking of the hæmoglobin readings.—For all readings a Duboscq colorimeter is used. To secure accuracy and comparable results from day to day it is absolutely necessary to secure an even illumination on the two halves of the fields. To ensure this, and at the same time to secure a greater delicacy of reading, it is to be recommended always to use a yellowish artificial light in a dark room. The light should be so shaded that only the reflecting mirror is exposed to the light rays. It is always necessary on each occasion to determine the actual difference in reading obtained by filling both cups with the same hæmoglobin solution, and in the calculation of the experiments to allow for these differences. If these details are scrupulously observed it is possible to obtain readings where the mean deviation is not greater than 0·3 per cent., when different hæmoglobin solutions are being read against each other. When a series of hæmoglobins is being compared, one of the samples is poured into the one cup and the other samples are in succession read against it. In the dilution of blood recommended a height of 10 mm. on the vertical measuring scale will give a good colour intensity for allowing accurate comparison. If too weak or too strong a colour is used the accuracy of the readings suffers considerably.

To secure and maintain an unchangeable standard from day to day and year to year, one or more of the bloods are finally read against a standard glass of suitable colour, and in this case it is absolutely necessary to use artificial light rich in yellow rays to obtain a perfect match of colour quality.

The advantage of using a Duboscq colorimeter is that it leaves the observer in absolute ignorance of the numerical reading until he has finally matched the colour, and therefore eliminates the personal equation, a factor of the greatest importance where minute changes have to be ascertained.

Observations.

The observations recorded in this paper have been carried out on goats and men. In the case of goats all blood samples have been taken by introducing a hollow needle into the external jugular vein and collecting the blood in a paraffined watch-glass as described above. In the case of men the samples have been taken in some of the experiments entirely from an arm vein, using a fine needle and a dry syringe, and in others by puncture of the back of a finger near the root of the nail. In a few experiments samples have been taken by both methods as nearly as possible at the same time, and in no case where the circulation has been free and normal, as already stated, has any difference been observed.

To exclude as far as possible the effects of feeding and rest, &c., on the curves, these conditions have been varied in different experiments, with the result that similar curves have been obtained under very diverse conditions. In men the changes found in the course of a long experiment in which no rest was taken for over 30 hours correspond fairly closely with others obtained when the individual was kept entirely at rest in bed, though the exact times for the rise and fall of the curves seem to be somewhat shifted in one direction or the other by the varied conditions. In all cases the times are given in real time, and we do not think that the change from ordinary time to "summer time" has produced any definite shifting of the curve. Even in one surgical patient in bed with marked excursions of temperature the general shape of the curve conformed to the normal type.

These points are brought out clearly by the five curves reproduced, four on men and one on a goat.

Curves 1, 2, and 3 (Fig. 1) are from different individuals within the same period of 25 hours, all the samples being taken from the arm veins without congestion. Curve 4 (Fig. 2) is from the same individual as curve 3, the samples being capillary blood obtained on another occasion by pricking the fingers. In the case of curves 1, 2, and 3 the persons stayed up the whole of the night without sleep or rest owing to the pressure of work. In the case of curve 4 the subject had a long night in bed, got up late, and did no work during the day. Although woken up at hourly intervals during the night, he slept well between the times when the blood samples were taken.

The most striking feature about curves 1, 2, and 3 is that, though the excursions between the highest and lowest readings show considerable variations, the general configurations of the curves are very similar, and the times of rise and fall are approximately the same. Towards the end of the experiment on subject 2 four control determinations were done by taking also capillary blood samples from the finger, which are represented by the broken line on the curve. The almost perfect correspondence between the two series of samples is evident. As a further control on many occasions two samples of blood have been taken with as short an interval as possible between them, and identical readings have usually been obtained, while a divergence of more than 1 per cent. has been extremely rare. Experimental errors are therefore probably slight.

A comparison of curves 3 and 4 shows a general similarity in character for the same individual on different occasions, though the contour seems to have been somewhat shifted to

one side or the other; and it is also to be remarked that the absolute excursions to be noticed from the highest to the lowest readings are very much greater in curve 4 than in curve 3, reading as much as some 15 per cent. The subject whose changes are given in curve 2 was also examined over part of the time corresponding to the experiment reproduced

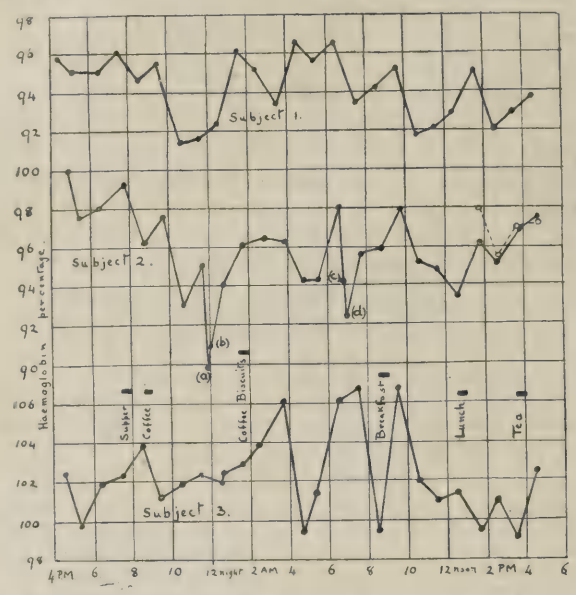

FIG. 1.—Curves 1, 2, and 3 are all from venous samples in men. Interrupted line at the end of curve 2 indicates control observations on capillary samples. All three individuals took their meals as indicated in the figure. Subject 2 was lying down from 12.36 to 12.56 A.M. when sample (a) was taken, sample (b) being taken at 12.59 after standing three minutes. The same subject lay down from 6.42 to 6.52 A.M. when sample (c) was taken, sample (d) being taken at 6.58 after standing six minutes.

in curve 4, and again the time relations of the rise and fall were very similar in the two subjects, who lived under the same conditions as regards meals, though considerably different as regards rest. Any shift in the curve was therefore apparently the same in the two individuals.

The curves reproduced in this paper are merely samples taken from a large series of observations made on a number of different individuals. In all of the curves reproduced for man the subjects were males.

From these curves it will be seen that the distance between the various highest and the various lowest points correspond

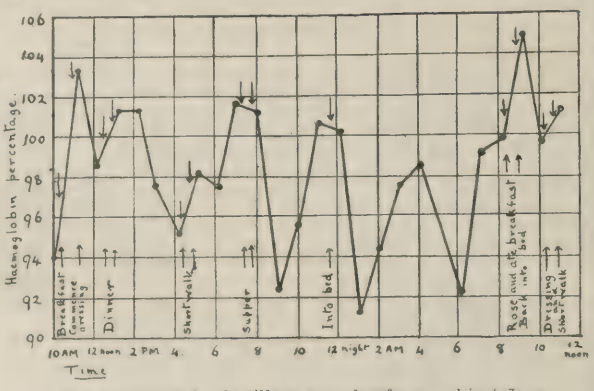

FIG. 2.—Curve 4. Capillary samples from subject 3 on another occasion.

approximately to some four to six hour intervals, and while usually the lowest readings are found somewhat near midnight the highest readings are obtained in the mornings between 8 and 10, or in evening about the same time. During the working day the lowest values occur in the early evening, and there is therefore a general agreement with the results of Lloyd Jones, who found the lowest specific gravity about that time.

In curve 5 (Fig. 3) is represented one series of observations on a female goat; this curve is only a single illustration of a number of observations made on different goats in connexion with other investigations carried out by two of us (G. D. and H. F. P.), which will be published later. In the goat the same general configuration of curve is to be found as in the case of man; though the exact hours do not absolutely coincide they fall fairly close together. Again, here we trace four to six intervals between the various highest and the various lowest points. The excursions are very considerable, even showing as much as 30 per cent. increase from the lowest to the highest reading, and that the changes may take place very rapidly is shown by the fact that within two hours an increase of some 23 per cent. is found, followed by a similar decrease within the next two hours.

There is some evidence that the female sex exhibits greater daily variations than the male.

Discussion of Results.

From the curves published it must become evident that in any kind of research dealing with observations where blood changes caused by extraneous influences are studied, it is absolutely essential to give the greatest possible consideration to diurnal variations in the concentration of the blood as shown by changes in the hæmoglobin percentage. If this is not done it is hardly possible to draw true and correct conclusions as to the real nature of any variations found. It is not unlikely that in view of the marked diurnal changes normally taking place we may have to reconsider results already obtained in a number of observations dealing with the blood and circulation, and it is also probable that some of the phenomena that have hitherto been veiled in obscurity may be more readily understood.

At the present moment we are unable to offer any rational explanation of these diurnal variations, though

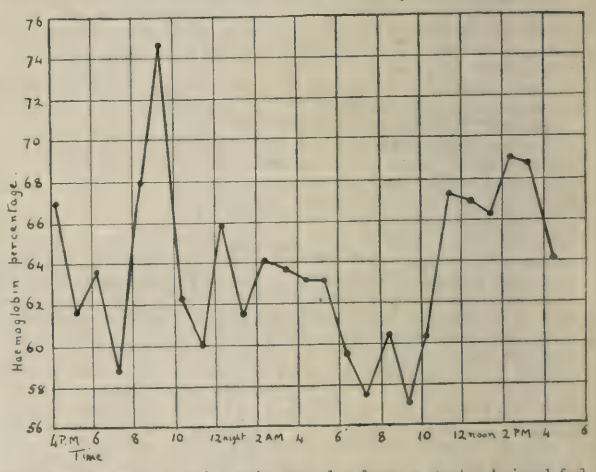

FIG. 3.—Curve 5. Jugular vein samples from a goat. Animal fed each day at 3.45 P.M. and allowed access to food and water the whole time of the experiment.

there is strong evidence that they are closely connected with variations in pulse-rate, blood pressure, rate and volume of respiration, and possibly with fluid absorption or kidney secretion, though it would be premature to attempt to express an opinion as to which is the primary factor in bringing about these changes. We do not consider that the suggestions put forward by one of us (H. C. B.) in the preliminary communication already quoted afford an adequate explanation of the facts in the light of this extensive series of observations.

In connexion with what we have put forward it is worth mentioning that changes produced by cold in the capillary circulation greatly resemble those found during shock by Cannon (1917), though his views regarding changes in colour index must be taken with some reservation until they have been confirmed by experiments with improved methods. It is also worthy of notice that some of the data for diurnal variations in the rate of kidney secretion given by Leathes (1919) show some similarities with the times when changes in the concentration of the blood occur, though any interdependence of the two remains unproved.

Conclusions.

1. The diurnal variations in hæmoglobin percentage met with in man and animals are very considerable and may even reach as much as 30 per cent., while 10 per cent. changes are of more or less common occurrence.

On an average the excursions seem to be more marked in individuals or animals with a low hæmoglobin content of the blood.

2. In attempting to establish the normal hæmoglobin content in a series of individuals it is essential to take the observations at a time of the day when the daily variations are found to be the smallest—i.e., late afternoon between 5 and 7 P.M.

3. In the study of any phenomena where alterations in the concentration of blood are concerned it is necessary to view them in the light of the marked normal diurnal variations that may occur.

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RUPTURE OF CÆSAREAN SECTION SCAR IN SUBSEQUENT PREGNANCY OR LABOUR.*

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AN obstetric surgeon has seldom to face an accident of pregnancy or labour more disturbing to his peace of mind than rupture of the scar of a former Cæsarean section. My interest in the subject has been excited by the following series of events in the obstetrical department of the London Hospital. In November last I operated on a patient almost moribund from the effects of rupture of the scar of a Cæsarean section performed in 1915; in February of this year I saw in the post mortem room a patient dead from abdominal sepsis consequent on rupture of the scar of a Cæsarean section I had myself performed in 1916, and in the years 1915 and 1916 three other of our Cæsarean section patients got rupture of their scars. The occurrence of five of these treacherous accidents in five years has made a very great impression on the minds of myself and my colleagues.

On inquiring into the subject I was impressed with the fact that we possessed very little information about rupture of the scar, either as to its causes, or, far more important, as to the frequency with which it occurred. At the outset I was struck by the wide divergence of opinion amongst the few with whom I talked or corresponded. On the one hand, I was told that rupture of the scar was more or less of a myth; on the other hand, I learned that certain outstanding surgeons—the Camerons of Glasgow, for example—were so afraid of ruptured scars that their invariable custom was to sterilise their patients at the first operation. Further inquiry proved that rupture of the scar was no myth, but was a real menace; I heard of recent cases in London and elsewhere; about a hundred cases had already been reported in the obstetrical literature of Europe and America. Obviously the subject required investigation. It seemed, above all, imperative to find out what was the actual frequency, the real risk, of rupture. Quite apart from the importance of this information to obstetric surgeons, patients themselves might wish to know what sort of obstetric future they were likely to have after submitting themselves to Cæsarean section. It seemed all the more important to get exact information in view of the increasing frequency with which the operation is being performed; its modern indications form an ever-growing list. There is another point: many patients who nowadays have had Cæsarean section have nothing to prevent them, in the event of a future pregnancy, from delivering themselves by the natural passages—a very different thing from the days when pelvic contraction was almost the only indication, when a repeated operation was the only way of future delivery, and when scars were seldom strained by labour.

If, on inquiry, the risk of scar-rupture was revealed to be a negligible one, then we could, with clear consciences, go on advising and performing the operation according to its extended indications; but if the risk turned out to be an appreciable one, then we should be forced to seek safety either by limiting the indications or by contriving an operative technique which would give a more dependable scar.

I have divided my paper into three sections: (1) An account of five new cases. (2) A general discussion on the ætiology and anatomy of ruptured scars and an analysis of the literature. (3) The results of a follow-up inquiry into the subsequent obstetric history of a large number of Cæsarean section patients operated on between 1912 and 1918.

1. AN ACCOUNT OF FIVE NEW CASES.

The details of the five new cases, from the London Hospital, are as follows:—

CASE 1.—Cæsarean section, 17/4/14, by Dr. Russell Andrews. Primigravida, aged 22, with extreme contraction of the pelvic outlet. Entered hospital early in labour at term. Uterus opened by anterior median incision; sutured with two layers of chromic catgut, a deep buried one including whole thickness of the muscle and missing endometrium, and a continuous peritoneal suture. Living child, weight 6¾ lb. Recovery good, temperature not above 99·4° F. during first four days, and afterwards not above normal.

Readmitted 13/8/15, with rupture of scar. No intervening pregnancy. Last menstrual period 11/11/14. Pain began suddenly on 13/8/15 at 2.30 A.M.; a continuous cramping pain which doubled her up made her vomit and faint. Admitted at 8 A.M., anæmic, pulse 120; was in continuous abdominal pain, uterus very tender and hard, abdominal muscles rigid, fœtal heart not heard; no labour pains, no external hæmorrhage. Concealed accidental hæmorrhage diagnosed. Laparotomy by the late Dr. Drummond Maxwell. An ovoid rupture, 1½ inches long, was seen in upper part of uterine scar. Placental tissue protruded through the rupture, and blood was oozing from it; about 2 pints of blood in peritoneal cavity. The uterus, with the ovum in situ, was removed by subtotal hysterectomy, and patient made a good recovery.

CASE 2.—Primigravida, age 19, admitted 26/7/14 with eclampsia, in thirty-eighth week of pregnancy. Before admission had already had five convulsions; between 5 A.M. and 11.30 A.M. had convulsions every half hour; treated with morphia, venesection, and intravenous saline. After temporary improvement convulsions increased in severity and frequency. At 2.30 P.M. Cæsarean section by Mr. Gordon Luker; labour had already started. Uterus opened by anterior median incision. Recently dead 7½ lb. fœtus delivered. Incision sutured with two layers of chromic catgut, deep and superficial. Convalescence febrile; temperature rose daily to 102° F. for first four days, for next seven it ranged between 100°. and 103°. Patient was discharged well on 16/8/14; abdominal wound healed by primary union.

Readmitted 19/11/15 in state of collapse in eighth month of second pregnancy. Laparotomy by Dr. Drummond Maxwell; dead fœtus and much blood in peritoneal cavity; rupture through scar of former Cæsarean section; placenta lay almost completely outside uterus, being still attached to one side of rent. Uterus removed by subtotal hysterectomy, but patient died shortly afterwards.

Description of the uterus: A uterus with a long, widely gaping rupture through anterior wall. Outside measurements of uterus: Length, 14·5 cm.; greatest width, 14 cm. Measurements of rupture: Length, 10·5 cm.; width at upper end, 7 cm.; at lower end, 5 cm. Thickness of uterine wall at edges of rupture, 2 cm. near the upper end, decreasing to 1·5 cm. near lower end. Continuous with the lower angle of the rupture is a linear thinned area in the uterine wall 2·5 cm. long; this is the unruptured part of the scar and is only 0·5 cm. thick. The edges of the uterine wall at the site of rupture are for the most part rounded and smooth. At first sight the impression is got that the whole thickness of the

* A paper read before the Obstetrical Section of the Royal Society of Medicine, May, 1920. Full table of cases of Cæsarean Section used in the collective investigation, as well as short abstracts of all reported cases of rupture of the scar, will be published in the Proceedings of the Royal Society of Medicine.

uterine wall had been torn through, but closer inspection shows that the decidual lining of the uterine cavity is continued up over these rounded edges and reaches in most places very close to the torn peritoneum. (See Fig. 1.) At the upper and lower ends of the ruptured area decidua and peritoneum almost meet. The irregularly torn peritoneal layer overhangs liberally the thick decidua-covered edges. (Fig. 2.) In the middle two-thirds, on both sides, is a well-defined subperitoneal hæmatoma stripping the peritoneum for some distance from the underlying uterine wall. Firmly adherent to the middle third of the whole thickness of the left edge of the ruptured area is a piece of placenta, covered by loosened peritoneum and a subperitoneal hæmatoma. (See Fig. 2.) On the opposite edge the decidual layer is absent and is replaced by a roughened area covered with broken laminæ of clot; this

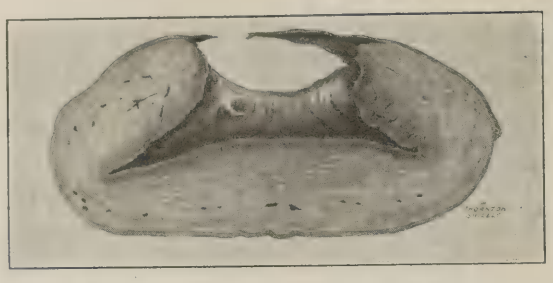

FIG. 1.—Drawing of section through upper third of uterus. Note—(1) Broad rounded edges of ununited muscle; (2) the decidua covers these edges and reaches almost to the peritoneum; (3) the narrow band of tissue between peritoneum and decidua on the right side, through which rupture has occurred; (4) the overhanging flap of wide thin scar area, consisting of little else than peritoneum.

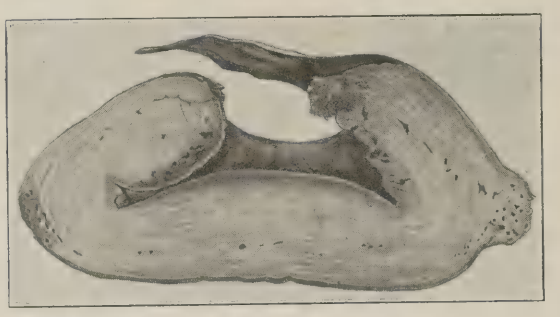

FIG. 2.—Drawing through middle of uterus. Note, in addition to points in Fig. 1—(1) Insertion of a piece of placenta into left edge of ununited muscle edge; (2) subperitoneal hæmatoma; (3) the broad thin scar area has torn through at one edge and not along its middle.

evidently represents part of the placental site. There are the remains of many thick omental adhesions to the peritoneum over the ruptured area. These findings are to be interpreted as follows. (1) The real scar, through which the rupture occurred, is extremely thin, and consists of little more than stretched peritoneum with here and there a thin layer of fibrous tissue. In its original state, before rupture, no doubt this thin peritoneal scar was covered beneath with decidua. (2) The thick edges of the ruptured area are the ununited muscle wall of the uterus, covered with decidua, except where they enter into the placental site. (3) The placenta was inserted over the scar and into the thick ununited muscle edges. (4) Retroplacental hæmorrhage probably occurred beneath the stretched scar before rupture occurred; in fact, retroplacental hæmorrhage may have been the determining cause of rupture.

CASE 3.—Cæsarean section, 26/3/14, by Dr. Russell Andrews. Patient aged 28, with flat rickety pelvis. Former labours: (1) 1911, instrumental dead-birth; (2) 1912, instrumental live-birth. Last menstrual period, 14/8/13; admitted in thirty-second week of pregnancy, on 26/3/14, after 18 hours in labour; os uteri two-fifths dilated, membranes intact, transverse presentation; head found too large to enter pelvic brim, so Cæsarean section performed; uterus opened by usual anterior median incision; sutured with two layers of chromic catgut, a deep buried one including whole thickness of muscle and missing endometrium, and a continuous peritoneal suture. Child alive; weight, 5¼ lb. Convalescence febrile, temperature rising daily for 13 days to 100° or 101° F.

Readmitted early in fourth labour on 16/3/16, thirty-two weeks pregnant. Labour pains began at 2.30 P.M. At 6 P.M. spontaneous rupture of the uterus, accompanied by collapse, pronounced anæmia, cessation of labour pains, and distinctive feeling of fœtus beneath abdominal wall. Immediate laparotomy; dead fœtus, placenta, and much blood were in peritoneal cavity. Scar ruptured in entire length; uterus removed by subtotal hysterectomy. Next day patient got left hemiplegia, but ultimately made good recovery.

CASE 4.—Rickety flat pelvis. Preceding obstetrical history: 1. Instrumental labour at term; dead-birth. 2. Instrumental labour at term; child lived a few hours. 3. Instrumental labour at term; dead-birth. In fourth labour at term patient admitted on 11/10/14, and Cæsarean section performed by the late Dr. Drummond Maxwell; anterior median incision, sutured with two layers, deep and superficial, of chromic catgut. Child alive, weight 6½ lb. Convalescence febrile; temperature rose to 102·8° F. on second day, and varied between 100° and 103° until seventh day, after which it gradually fell.

Readmitted in fifth labour, at term, in 1916. Head engaged in pelvic brim; forceps applied, and a healthy child of 7 lb. delivered. Puerperium febrile; temperature rose to 103° on fourth day, fell by lysis, and reached normal on ninth day.

Readmitted in sixth pregnancy with rupture of uterus on 8/8/19; last menstruated on 1/12/18. At 12 o'clock, midday, whilst sitting in a chair, suddenly got intense abdominal pain and fainted; her friends summoned assistance at 3 P.M. She was found in last stages of collapse, and was immediately transported to hospital. On arrival was profoundly anæmic and collapsed; abdomen distended and extremely tender; fœtus felt with remarkable distinctness, and what was surmised to be empty uterus was felt reaching to umbilicus. Immediate operation by Mr. Eardley Holland, under stovaine spinal anæsthesia; dead fœtus and much blood found free in peritoneal cavity. The placenta was almost completely separated, and lying just outside a large gaping rent in anterior wall of uterus, a very small part being still attached near the left edge of the rupture. After removing fœtus and placenta attention was turned to the uterus, which was rigidly contracted and anæmic, with a long, widely gaping rupture occupying almost whole length of anterior wall. The rupture looked like a clean tear, except at its upper and lower ends, where it had extended laterally to a slight extent. Its edges were thick and smooth, giving the false impression that the rupture had occurred through the entire thickness of the uterine wall. Projecting from the thick edge of one side was a ragged leaf of thickened peritoneum, about 1 cm. wide; this was in reality the stretched scar, and it had ruptured, not along its middle, but along its junction with the opposite thick edge. There had been a complete failure of muscular union, and the ununited muscle formed the two thick edges. The rupture was rapidly closed with a single layer of interrupted sutures of No. 3 silk, placed about ½ cm. apart, and including whole thickness of uterine wall except endometrium. Patient made an excellent recovery. For first week evening temperature rose to 100°, but there was no other trouble.

CASE 5.—Cæsarean section, 26/2/17, by Mr. Eardley Holland. Primigravida, age 20, admitted with eclampsia in thirty-sixth week of pregnancy. Had three convulsions before admission, was comatose, and urine, on boiling, was solid with albumin; cervix intact, no labour pains, fœtal heart heard. Cæsarean section under stovaine spinal anæsthesia; uterus opened by anterior median incision, fœtus dead, placenta posterior. Incision closed with No. 3 interrupted silk sutures, placed about ½ c.m. apart, including whole thickness of uterine wall except endometrium; this layer was covered with a continuous peritoneal suture. Convalescence febrile; temperature ranged between 100° and 102·6° F. for first seven days, lochia offensive; abdominal wound healed by primary union.

During second pregnancy was a regular attendant at antenatal department. Last period 28/5/19; urine never contained albumin, and health excellent. Was admitted again on 17/1/20, with severe puerperal sepsis following premature confinement. Only an imperfect history could be obtained; labour was completed in a few hours on 11/1/20; placenta retained, and was removed manually, with difficulty, two hours after birth of child, which lived only a few hours. The following day she got abdominal pain and dyspnœa, and was sent into hospital. On admission into septicæmia ward on 17/1/20 was extremely ill; temperature 104°, pulse 120, abdomen rigid and tender, constant diarrhœa. She was considered to have puerperal septicæmia, but blood cultures taken on different occasions were sterile. Perineum completely ruptured into rectum. For a fortnight she held her ground and even improved slightly in her general condition. Abdominal section was considered and rejected. The discharge from her uterus became more and more offensive, and was ultimately fæcal in character. She died on 16/2/20.

Post-mortem examination notes: General purulent peritonitis, with localised abscesses. Fibrous peritoneal adhesions at fundus of uterus, between bladder, uterus, and small and large intestines. Pus tracking up right and left sides of abdominal cavity. Localised subdiaphragmatic abscess in antero-superior surface of right lobe of liver. Perforation 1 cm. in diameter in wall of small intestine, 240 cm. below duodeno-jejunal flexure. Dense fibrous peritoneal adhesions with pus pockets between lower coils of small intestine and uterus. Rounded perforation 3 × 2 cm. on anterior wall of fundus of uterus. Dirty-green diphtheroid inflammation of endometrium. Dilatation with purulent content in Fallopian tubes. The pelvic viscera were removed en masse, and showed the following details. Uterine cavity 7 × 4 × 4 cm. The rupture measured 3 × 2 cm., with rounded and smooth edges; the right edge was 1·5 cm. thick, and the left 0·5 cm. The scar had ruptured in its lower two-thirds; the unruptured part, which could be seen and felt as a thin furrow on the inner surface of the anterior wall, was 1·8 cm. long; remains of many old firm adhesions over anterior surface and fundus of uterus, one particularly broad and firm one covering unruptured part of scar. Left half of uterovesical pouch of peritoneum obliterated by dense adhesions between bladder and uterus; to right of mid-line it was occupied by an abscess cavity with fæcal contents. This abscess communicated with the already-mentioned tear or perforation in the small intestine and with the uterine cavity, through the rupture. Thus, there had been a utero-intestinal fistula. Whether the intestine was injured at the time the rupture occurred, or whether the perforation arose subsequently, cannot be said for certain; I favour the former view.

A point of special interest in this case is whether the scar ruptured spontaneously during labour, or whether it was ruptured during the difficult manual removal of the placenta. In the light of other reported cases I am inclined to think it ruptured during labour, and that the retention of the placenta, as well as the difficulty of its removal, was due to its partial escape into the peritoneal cavity.

2. ÆTIOLOGY AND PATHOLOGY OF RUPTURED SCARS; REVIEW OF THE LITERATURE.

I have found accounts of 92 cases, reported in sufficient detail to make them worth collective study, and have made a short abstract of the essential facts of each case. I have omitted a few cases to which I found references, but of which I could neither get at the original report nor find reliable abstracts. It is obvious, too, that many cases have never been published at all; speakers in discussions before societies on the subject of ruptured scars often refer to such cases, personal or otherwise. Up to a point, references to cases were not hard to find, and I am indebted to other writers who have published collections of cases, especially to L. Singer (1909), Albert Wyss (1912), Palmer Findley (1916), and E. Schroeder (1916).

The classical operation dates from 1882, when Sänger and others published their suture methods. I need hardly state that I have not included cases of ruptured scar following the operation of pre-suture days; one-half of the minority who survived this operation got a ruptured scar in the unfortunate event of a future pregnancy. The first case in my list, Koblank's, occurred in 1891, and more than two-thirds have been reported since 1910, coinciding with the period when the indications for Cæsarean section began to be extended. Unfortunately, all cases are not found reported in full detail; but amongst the sum of the cases the data are in sufficient number to indicate the chief factors favouring rupture of the scar. I have isolated the essential points of these 92 reported cases and of my own five in the following summary, so that the extent to which each one occurs can be conveniently noted and its individual importance estimated.

Summarised Analysis of Reported Cases.

Parity.—Rupture occurred in the second pregnancy in 54 cases, the third in 19, the fourth in 10, the fifth in 6, the sixth in 3, the eighth in 1; number of preceding pregnancies not mentioned in 4.

Indications for Cæsarean section.—Contracted pelvis in 64 cases; eclampsia in 12; nephritis, albuminuria of pregnancy, fibromyoma of uterus, hæmatoma of vagina and vulva, sacral tumour, stricture of cervix, vaginal varices, shoulder presentation, concealed accidental hæmorrhage in 1 each; dermoid cyst of ovary in 2; indication not mentioned in 10.

Cæsarean section incision.—Anterior median in 54 cases, posterior median in 1, transverse fundal in 28, anterior median and transverse fundal (repeated operation) in 1, cervical in 1, site of incision not mentioned in 12.

Relation of incision to placental site at Cæsarean section.—Incision through placental site in 10 cases, not through placental site in 6, placental site not mentioned in 81.

Suture material.—Catgut in 41 cases, silk (often with continuous catgut for the peritoneum) in 12, reindeer tendon in 1, suture material not mentioned in 43 cases.

Fever or sepsis during recovery from Cæsarean section.—Recovery febrile, or abdominal or uterine infection, in 51 cases; recovery stated to be afebrile in 15 cases; no details mentioned in 31.

Interval between Cæsarean section and rupture.—Less than one year in 2 cases, one year in 12, two years in 25, three years in 21, four years in 13, five years in 3, six years in 3, more than six years (including one of 11 and one of 12) in 4; interval not stated in 14 cases.

Number of Cæsarean sections preceding rupture.—One in 88 cases, two in 6, three in 2, number not mentioned in 1 case.

Number of labours intervening between Cæsarean section and rupture.—None in 85 cases, one in 8, number not stated in 4 cases.

Period of pregnancy at which rupture occurred.—At term in 47 cases, near term in 6, 8½ months in one, 8 months in 10, 7½ months in 1, 7 months in 8, 4 months and again at 7 months in 1, 38 weeks in 3, 37 weeks in 2, 36 weeks in 4, 32 weeks in 2, in early pregnancy in 1, at 11 months (post-mature) in 1, period not stated in 10.

Whether rupture occurred during labour or before the onset of labour.—In labour in 19 cases; in labour, early in first stage, in 29; during pregnancy, before the onset of labour, in 36; no details given in 13.

Relation of placenta to scar at time of rupture.—Placenta implanted over scar in 34 cases, placenta not implanted over scar in 17, placental site not mentioned in 46.

Accidental factors likely to have been exciting cause of rupture.—None mentioned in 80 cases, hydramnios in 2, twins and hydramnios in 1, version in 2, induction and version in 2, accidental hæmorrhage in 1, an accident in 1, difficult breech labour in 1, post-mature fœtus in 1, fœtus excessively large in 1, placenta prævia (hydrostatic bag) in 1, pituitrin in 1, pituitrin and obstructed breech labour in 1, manual removal of placenta in 1, long labour with contracted pelvis in 1.

Extent of rupture.—Rupture of entire or almost entire length of scar in 67 cases; rupture of small portion only of scar in 22; extent not mentioned in 8.

Treatment of rupture.—Hysterectomy (subtotal) in 56 cases; vaginal hysterectomy in 2; suture, sometimes with excision of edges, in 26; drainage in 2; treatment not stated in 1; death before operative treatment in 10.

Result to mother.—Lived in 66 cases, died in 28, not mentioned in 3.

Result to child.—Dead in 69 cases, lived in 21, not mentioned in 7.

The Anatomy of the Uterine Scar.

(A) *Perfectly healed scars.*—Perfect healing of the uterine incision may result in complete muscular regeneration, leaving no trace of scar tissue except on the peritoneal surface.

Whitridge Williams has studied the cicatrix in 10 uteri, removed by Cæsarean hysterectomy, which had been subjected to Cæsarean section upon one or more previous occasions. In 8 of his specimens (one of which had been subjected to two, and another to three, previous Cæsarean sections) it was difficult to find the old cicatrix by examination with the naked eye; the only indication of its existence was the presence of slight vertical depressions upon the external and internal surfaces of the uterus. Microscopical examination revealed the entire absence of scar tissue in the uterine wall, and showed the muscle fibres extending across the site of the old incision as if it had never existed. It is interesting to note that the convalescence from the previous operations had been uncomplicated.

In another specimen deep furrows existed on the external and internal surfaces of the uterus, the two being separated by a band of tissue 3 mm. thick, in contrast to the adjacent uterine walls, which measured 2·5 cm. in thickness. The external furrow was covered with peritoneum and the internal was lined with typical decidua; the intervening tissue was normal muscle, showing no trace of scar tissue, and differing from the normal only by its thinness. The history of this patient was that the convalescence had been stormy.

(B) *Thin scars.*—Light is thrown on the causes and anatomy of ruptured scars by studying scars that are thin, for it is only thin scars that are likely to rupture. A thin scar becomes progressively stretched and thinned during pregnancy owing to the increasing distension of the uterus.

Thinning of the scar, as found at a repeated Cæsarean section or in a uterus removed for some reason from a patient who has formerly had a Cæsarean section, is not at all uncommon; every obstetric surgeon of experience has encountered it. Harrar, at the New York Lying-in Hospital, found that in 50 instances of the repeated operation in 42 the old scar was either not found at all or, if found, was solid, in 4 there was marked attenuation, in 2 there was partial rupture at the location of the old scar, and in 2 there was complete rupture. Van Leuwen collected all cases of repeated operation reported in literature down to 1903, and found thin scars reported in 20 out of 117 cases. These figures probably represent cases of extreme thinning only. A moderate degree of thinning or extreme thinning of a small portion of the scar is, in my experience, much more common than this if looked for by palpating the whole length of the scar, after the uterus has been emptied, between a finger within and a finger without the uterus. By various writers these wide, thin scar areas, as found at repeated operations, have been described as, "as thin as paper," "only 1 to 2 mm. thick," and have sometimes been mistaken for the bulging amnion herniated through the scar. Sometimes a subperitoneal hæmatoma has been observed—an indication of imminent rupture.

There are, of course, varying degrees of thinning of the scar. Sometimes it is extreme, sometimes moderate; sometimes the entire length of the scar is affected, sometimes only a part. The only case I have found recorded in which the thin scar consisted of normal muscle is that of Whitridge Williams, to which I have already referred. In all others it was composed of scar tissue, often with a varying proportion of muscle fibres scattered through it. In my own second case the unruptured part of the scar consists almost entirely of scar tissue, but muscle fibres, singly or in groups, are scattered through it, and have even grown right across its whole width. In cases of extreme thinning the attenuated scar area consists merely of peritoneum in contact with decidua, with a few intervening strands of fibrous tissue. These attenuated peritoneo-decidual scars are just the ones liable to rupture during pregnancy or labour from a rise of intra-uterine pressure. The point of greatest importance about these scars is that the uterine muscle has completely failed to unite; the sutures employed to close the incision either slough out or cut out, and the muscle surfaces retract and become widely separated. The peritoneum, on the contrary, holds firm. The retracted muscle surfaces later become smooth and rounded and in course of time covered by a layer of endometrium, which in a subsequent pregnancy is converted into decidua. The endometrium grows also across the line of the scar beneath the peritoneum and

covers the inner surface of the gap. Further thinning of this peritoneo-decidual scar is the natural sequence of the distension of the uterus during pregnancy.

The analogy between such a scar and a defective abdominal scar is irresistible; the one consists of peritoneum and decidua, and the other of peritoneum and skin; in both the muscle is wanting. In some cases even peritoneal union has been demonstrated to have failed in parts of the scar, and the gaps have been plugged by adherent omentum or even bowel. Excellent histological studies of thin scars have been published by Couvelaire, Offermann, Spalding, and others.

(C) *Ruptured scars.*—There is no doubt that when the scar has ruptured it has nearly always been one of the thin scars described in the foregoing section. The peritoneo-decidual scar has gradually become converted into a widely stretched area during the progressive uterine distension. When this thin area ruptures it has usually been noticed that the line of rupture does not occur along its middle, but at the sides, near the thick part of the uterine wall. A thick or even a moderately thick scar, whether composed of fibrous or muscular tissue or both, does not rupture except under extreme provocation, such as obstructed labour.

The appearance of a ruptured scar, after the uterine contents have escaped and retraction has occurred, is deceptive and has, in the earlier observed cases, led to wrong descriptions and tortuous explanations. The deceptive feature is the thickness of the edges of the ruptured area. These edges, as already pointed out, consist of the ununited muscle surface covered with decidua. After the uterus is emptied and retracted these muscle edges become equal in thickness to the rest of the uterine wall. Furthermore, these thick edges, since chorion or placenta has been separated from them, are either found oozing blood or covered with pieces of blood clot. In fact, their appearance is almost exactly as if the whole thickness of the uterine wall had been newly torn through, whereas in reality it is only the stretched deciduo-peritoneal area that has given way. The true state of affairs is illustrated in Figs. 1 and 2, where the decidua can be followed from the uterine cavity over the ununited muscle edges almost up to the ruptured peritoneal coat. In my own fourth case, where I sutured the rupture, I believed I was suturing thick, recently ruptured surfaces; it is only in the light of the experience from my second case and of cases reported in the literature that I now realise I sutured together the old ununited muscle surfaces.

Liability of Uterine Incision to Yield Shortly After Operation.

It is not often that Cæsarean section cases come to post mortem, and it is even rarer for a case to be reopened for hæmorrhage or sepsis. In such cases it is surprising how often there has been observed a yielding of the incision from the loosening or cutting through of the sutures.

Wyss has made a small collection of these cases. Sheffzek reports two post mortems after Cæsarean section in which the catgut sutures had become completely unknotted. Boissard reports the case of a patient who died from sepsis on the fifth day; four of the interrupted catgut sutures had become untied and the incision gaped widely; there was intraperitoneal hæmorrhage, and the uterine cavity was filled with blood clot. Cristalli reports a case where, because of severe and persistent hæmorrhage following Cæsarean section, the abdomen was reopened; a gap was found in the uterine incision, which had been sutured with silk. One is led to believe that this accident may sometimes happen in cases that recover; they would not necessarily pass through a stormy convalescence, for such an accident, without sepsis or with only local sepsis, should not produce much disturbance. The partially or completely gaping scar would quickly be sealed or plugged by omentum. It is quite probable that the firm adhesion of omentum to the old scar, so commonly found in cases of repeated Cæsarean section or subsequent rupture, may represent the same protective plug.

Utero-abdominal Fistula.

This is not a great rarity, following infection of the uterine and abdominal wounds, and may persist for many months; the uterine scar in such cases is bound to be extremely defective and liable to rupture in subsequent pregnancy. Amongst the reported cases of ruptured scar, utero-abdominal fistulæ had followed the Cæsarean section in five.

If accompanying the fistula the uterine scar is completely adherent to the abdominal wall, subsequent rupture may be entirely extraperitoneal. An interesting example of this is recorded by Noble (not placed amongst the list of ruptured scars). A utero-abdominal fistula persisted after the first Cæsarean section; another pregnancy soon followed and the liquor amnii escaped through the fistula in the thirty-third week. The second Cæsarean section was performed by enlarging the fistulous opening; the uterine scar was found completely adherent to the abdominal wall, and the operation was entirely extraperitoneal.

The Site of the Uterine Incision and Subsequent Rupture.

On referring to the summary of reported cases it will be noted that, in the 85 cases where the site of incision was stated, the anterior median incision was employed 55 times, the transverse fundal 28 times, and the cervical only once. There is no doubt that the transverse fundal incision, introduced by Fritch in 1897, is specially liable to rupture. The number of ruptures after this incision, compared with the number after the anterior median, is relatively very high, considering how late it was introduced, and how relatively few must be the number of Cæsarean sections in which this incision was employed. A point which theoretically favours rupture of transverse fundal scars is that most of the muscle bundles are cut at right angles, and the incision therefore tends to gape widely, favouring imperfect union.

The incision that at present holds the best record for immunity from rupture is the cervical (by this I mean the transperitoneal or extraperitoneal cervical operations, of which, as is well known, there are many varieties). All the same, before this incision is lauded because of its apparent immunity from rupture it must be remembered that very few cervical Cæsarean sections have, up to now, been performed, compared to the thousands of classical and transverse fundal Cæsarean sections; it still has to stand the test of time.

The cervical incision was first employed by Frank in 1906. It was at once pointed out by the theorists that the cervical scar would be specially prone to rupture; it lay in that part of the uterus most subjected to stretching during labour, and, being placed nearer the contaminated area (i.e., the vulvo-vaginal tract), would therefore be more liable to infection. These fears have not been fulfilled; only one case of rupture has been reported, by Wolff in 1914, and only a small number of thin cervical scars have been observed, in spite of the fact that many cases of subsequent pregnancy have occurred. There seem to be excellent reasons for the sound healing of cervical scars. Rest is an essential to good union of divided muscles; a state of rest or immobility is impossible in the body of the puerperal uterus, where contractions and relaxations are constantly tending to disturb the apposed surfaces and draw the healing muscle fibres apart. All operators are aware of the great lateral tension on the sutures and of the tendency of the incision to gape during a strong contraction. On the other hand, the cervical incision is situated in a quiet part of the uterus which does not undergo contractions and relaxations. In Frank's original operation he incised the cervix transversely; this has now been generally replaced by a longitudinal incision. The stretching and rupture of the transverse scar would seem more likely because its line lies at right angles to the direction of the chief pull of the uterine muscle fibres; whereas the longitudinal scar lies in the line of the pull, and its edges have scarcely any tendency to be drawn apart.

Influence of Implantation of the Placenta over the Scar.

The relation of the placenta to the scar at the time of rupture was noted in 51 out of the 97 cases; in 34 cases it was implanted over the scar, and in 17 it was not. From this it may be assumed that the implantation of the placenta has at all events a share in predisposing the scar to rupture, but far too great importance has in the past been attached to this point. That the placenta cannot be the direct cause of rupture is obvious enough, for, on the one hand, the placenta is very often not over the scar in cases of rupture, and, on the other, in cases of repeated Cæsarean section it is often found over the scar without any harmful effect.

The idea that implantation of the placenta over the scar was the cause of rupture came very early into the field. It was known that rupture of the pregnant tube was caused by the eroding action of the villi, and that in certain cases of placenta prævia the lower uterine segment was appreciably weakened and more liable to traumatic rupture. An analogy between these two and scar rupture was tempting; but there is no histological evidence to show that chorionic villi invade scar tissue any more than they do normal uterine

tissue. It has also been suggested that when at the original Cæsarean section the incision is over the placental site perfect healing is interfered with; there is no histological evidence for this. Amongst the 97 cases of ruptured scar the relation of the incision to the placental site at the original Cæsarean section is only mentioned in 16 cases, in 10 of which the incision was over the placental site. Nothing can be inferred from these figures; it must be remembered that when the operator encounters the placenta in his incision he may state the fact in his records, but that he is much less likely to state the negative fact.

I believe the reason why implantation of the placenta over a thin scar increases its liability to rupture is the occurrence of retroplacenta hæmorrhage. The first step towards this is a gradual yielding and widening of the scar area; there follows a very gradual, and probably very slight, separation of the placenta over and adjacent to the scar area. The mechanism of this separation is comparable to the separation of a placenta prævia from the lower uterine segment when the cervix begins to dilate. Hæmorrhage between the scar area and the placenta will bring about a sudden rise of pressure sufficient to precipitate rupture. In my own Case 2 there was beneath the peritoneal scar area a well-defined subperitoneal hæmatoma, which had extended laterally, stripping the peritoneum off the uterine wall; I do not think this occurred entirely after the event. In a case of ruptured scar reported by Wing there was a well-defined blood clot on the maternal surface of the placenta, and there can hardly be any doubt that hæmorrhage between the scar area and the placenta was the direct cause of the rupture.

Effect of Sepsis on the Healing of the Uterine Wound.

Of all the causes of imperfectly healed scars sepsis is by far the most important. Reference to the summary shows that fever or sepsis during recovery from the Cæsarean section was noted in 51 out of 66 cases; in only 15 of the 66 was the recovery afebrile. It is obvious that infection and suppuration of the uterine incision must of necessity be followed by imperfect healing.

If the septic process be severe the uterine tissues included between the sutures will undergo necrosis; the sutures will cut out, the muscular walls will retract, and the end result will be a scar which consists of little more than peritoneum with a protective layer of omentum or other adhesions. Even if the sutures do not cut out, the wound will have to pass through a stage of granulation tissue, and will result in a broad, fibrous scar. If silk be employed, the suppurative process will continue until the silk sutures have come away; cases have been recorded in which silk sutures were found in the uterine discharges. In the two cases recorded by Wyss, in one silk stitch sinuses persisted for many months; and in the other, after a persistence of stitch sinuses, the linen thread sutures were removed from the interior of the uterus by curetting. If catgut be employed, its absorption will be hastened by sepsis. The point will be raised that in 15 cases of rupture there was no evidence of sepsis in that the convalescence was afebrile. But infection of the uterine wound may occur without rise of temperature, or with only a very slight one; for example, few will deny that the presence of extensive adhesions to the scar at a subsequent operation is evidence of sepsis during the healing process, and there must be many operators who have found these adhesions when the temperature chart of the original Cæsarean section did not betray sepsis. For example, at a second operation I found such extensive adhesions of the great omentum to the abdominal wall and to the uterine incision, accompanied by such a number of enormously distended blood-vessels, that I had to eventrate the uterus and incise its posterior wall; palpation of the old scar showed that it was extremely thin in places, and formed a series of deep pits on the inner surface of the uterus. After the first operation the temperature had been charted every two hours during the first five days; on the second day the highest record was 99·6° F., on the third 99°, on the fourth 98°, on the fifth 98·4°. During the following days the only records above normal were 99·2° on the ninth day, 99·8° on the eleventh, and 99·6° on the fourteenth. The abdominal wound healed by primary union, and the patient made an exceptionally smooth convalescence. Silk was employed to suture the uterus. Here there had clearly been infection of the uterine wound, and yet the temperature chart did not betray it. The point is, that although the temperature chart may be a smooth one, infection of the uterine wound may occur sufficient to impair healing. I believe that the operation of Cæsarean section can never be guaranteed as a surgically clean one, for there is a large wound in a mucous cavity in direct communication with, and within a short distance of, a contaminated area (the vulvo-vaginal tract). It is sufficiently well known that hæmolytic streptococci have frequently been found in the normal puerperium, not only in the vagina, but also in the apparently healthy uterus. I have been surprised by the large number of Cæsarean section cases in which the recovery was febrile; in the London Hospital and City of London Maternity Hospital series of 84 cases recovery was afebrile in only 38, or 45 per cent. (trivial rise of temperature in first 48 hours of course not counted).

A study of the type of convalescence from a Cæsarean section is of the utmost importance in arriving at a decision as to the management of future pregnancies.

If the convalescence has been febrile and there has been other evidence of sepsis the scar is probably thin and there is risk of rupture. If, on the other hand, convalescence has been afebrile the chance of rupture is a very small one, but it is quite plain that there is no absolute guarantee against rupture, since an appreciable number of cases of rupture have been reported even after an afebrile convalescence. On the other hand, it can be shown that patients whose convalescence has been accompanied by even considerable fever can successfully deliver themselves on a future occasion by the natural passages.

Suture Material and Method of Suture.

In all the cases under review except one the entire thickness of the uterine wall was sutured either by introducing buried layers, or by using deep sutures which passed through the whole thickness of the uterine wall except the endometrium. There is no need to dwell upon this point, as it may be taken for granted that all modern operators take good care to unite the whole thickness of the uterine wall.

Great controversy has waged about the best suture material for closing the uterine incision. On looking at the table it will be noted that, out of the 53 cases in which the suture material used for the deep sutures is mentioned, catgut was employed in 41 and silk in 12; in most of the cases in which silk was used there was also a superficial peritoneal suture burying the knots of the deep layer. It would be false reasoning to conclude from these figures that rupture is more liable to occur after catgut than after silk. Before it is justifiable to come to such a conclusion it would be necessary to know the relative frequency with which silk and catgut were employed. In Great Britain, up to the year 1910, Dr. Amand Routh's book tells us (p. 23) that, of the 81 operators who sent him particulars, 41 used silk for the deep sutures, 27 catgut, 8 silkworm gut, and 4 linen thread. Since the date of this inquiry, amongst those surgeons who have sent me particulars of their cases for the period under investigation (1912–1918) the use of catgut is far more customary than that of silk. (See Table I.) From reading modern text-books and monographs by American and German authors it is apparent that catgut is almost universally used in those countries; in France silk is still preferred. There seems to be no doubt that catgut has been in the past, and still is, far more commonly employed than silk. It is not justifiable therefore to conclude from the figures relating to the use of catgut and silk respectively, in cases of ruptured scar, that catgut is more blameworthy than silk.

The suture material can, of course, only be of importance during the process of healing, and so long as a slowly absorbable preparation of catgut, such as chromic, is used, capable of resisting absorption for at least three weeks, there can be no objection to its use so long as the wound is healing aseptically. A point that has been emphasised is that in the involuting uterus the intracellular enzyme activity is considerably raised, and that therefore a protein material, such as catgut, would be absorbed more quickly than in other tissues; this point is a sound one, and is sufficient reason for not employing plain catgut, which is quickly absorbable. If the uterine incision becomes infected the process of healing is, of course, considerably delayed, and the absorption of catgut hastened; for this reason I think catgut has serious disadvantages. In the case of an infected wound, whose muscular edges are constantly tending to be drawn apart by the retractile power of the muscle, it is important that the edges should be kept in apposition for as long as possible. Here catgut fails, and a less absorbable material is far preferable. Since it is, in my opinion, impossible to guarantee aseptic healing of the uterine incision, I believe that catgut should be avoided. (See also Part 3 for the conclusion arrived at as the result of the collective investigation.)

Considering now the two types of non-absorbable suture, we have to consider silk or linen thread and silkworm gut.

Theoretically, silkworm gut is far the more preferable; it is well known that if infection occurs silk sutures encourage the process of suppuration, which goes on almost indefinitely, and seldom ceases before the sutures have come away

naturally or have been removed. Silk in an infected wound is an irritant and an inveterate harbourer of bacteria. On the other hand, silkworm gut is an inert material in the presence of bacteria, and has little or no influence in prolonging the suppurating process. My own opinion is strongly in favour of the use of silkworm gut for the deep uterine sutures, firstly, because it is a non-absorbable material and will hold the sides of the uterine incision in place for an indefinite period of time, unless, of course, it cuts out owing to an extensive necrosis of the tissues; secondly, because it is an inert material in the presence of bacteria. It is interesting to note that no case of ruptured scar has been reported in which silkworm gut was used; it would be wrong, of course, from this to jump to a too obvious conclusion, for silkworm gut has been relatively very seldom employed.

Another point I consider of great importance in suturing is to wait for complete retraction before inserting the sutures; if the wound is sutured before retraction is complete and the muscular walls are thin the result is bound to be a scar thinner than the rest of the uterine wall, for the sutures fail to include layers of muscle fibres which during complete retraction would have slid inwards and become rearranged, adding to the thickness of the sides of the incision.

Accidental Factors in Causation of Rupture.

Any circumstance in pregnancy or labour which is likely to strain the scar to an exceptional degree may precipitate rupture in a case in which, under ordinary circumstances, the scar, though a weak one, might have remained intact.

Such circumstances in pregnancy are the over-distension of the uterus by hydramnios, excessive size of the fœtus or twins, a large retroplacental hæmorrhage, or the introduction of a hydrostatic bag; in labour, prolonged or obstructed labour, internal version, or the use of pituitary extract. It will be noted that such accidental factors are recorded in only 17 of the 97 cases. A study of these cases points the moral that patients who bear Cæsarean section scars should not be allowed long labours, and that the employment of version, bags, or ecbolic drugs is to be avoided.

Some Clinical Points.

Parity, interval between the Cæsarean section and rupture, number of Cæsarean sections preceding rupture, treatment, and result to mother and child require no further comment here. The bare facts are sufficient, and will be found in the summary of cases. Other points deserve closer consideration.

Labours intervening between Cæsarean section and rupture.—In eight cases one delivery by the natural passages occurred between the two events. Why did the uterus stand the stress of one pregnancy and labour only to yield to it in the next? We naturally turn to inquire whether any additional stress had been put on the scar beyond that of the normal state. In four of these we find unusual circumstances: in one the labour lasted 20 hours and the pelvis was contracted; in one the placenta was implanted over the scar; in one delivery was by internal version; and in one labour was induced by a hydrostatic bag for toxæmia of pregnancy. In the other four there was no abnormality of pregnancy or labour; it is unwise, therefore, to indulge in any false sense of security merely because a patient has already delivered herself by the natural passages.

Period of pregnancy at which rupture occurred.—In 70 out of the 87 cases in which the period is stated the scar ruptured at full term or within a month of it. In a case reported by Hermann either the scar had ruptured at a very early period of pregnancy or, what is much more likely, the original Cæsarean section incision had always remained open from imperfect healing and was sealed by adhesions only; the ovum had developed partly in the uterus and partly in the abdominal cavity. The fœtus lay in an intraperitoneal gestation sac—a case of secondary abdominal pregnancy. In one case (Richter) a partial rupture occurred in the fourth month, which was completed at the seventh. Of the cases where rupture occurred in the seventh month (see summary) in only two was there any explanation for such early rupture: in one a bag was inserted for placenta prævia, and in the other the placenta was implanted over the scar. Circumstances which should favour early rupture are implantation of the placenta over the scar and retroplacental hæmorrhage, hydramnios, and operative manipulation; also excessive thinness of the scar, especially where there are gaps in the line of the scar merely closed by omental adhesions.

Moment of rupture, during pregnancy or during labour.—It will be observed from the summary that in the 84 cases in which this point is stated rupture occurred during labour in 48 and before the onset of labour in 36. Of the former rupture occurred early in the first stage in 29. This aspect of the subject is plain enough; a scar is much more strained during uterine contractions than during the quiescent period of pregnancy, and if labour be allowed to continue for a long time, especially if obstructed, the scar is subjected to an unwarrantable strain. A point worth bearing in mind is that for many patients who go into labour subsequently to a Cæsarean section the labour is for all intents and purposes a primiparous one; a patient who has had labours previous to the operation is less likely to strain her scar and get a rupture than a patient whose operation was done when she was a primigravida. Other circumstances which obviously favour rupture during pregnancy are over-distension of the uterus and implantation of the placenta over the scar with retroplacental hæmorrhage; only a few examples of such will be found amongst the 36 reported cases, and it must be assumed that thin scars often yield under the influence of the normal intra-uterine pressure. The possibility of rupture of the scar during pregnancy and as early as the seventh month is a very sinister feature of the accident. It makes it difficult for us, however forewarned by our knowledge of the risk run by the patient, to protect her completely from the consequences; we cannot very well keep her under close observation in a hospital or nursing home from the seventh month onwards, ready to operate at the first sign or symptom.

Cases with absence of, or with very slight, symptoms.—All are familiar with the usual signs of rupture of the uterus: sudden pain, collapse, signs of intraperitoneal bleeding, cessation of labour pains, and the distinctive feeling of the fœtus and retracted uterus. The point about these cases of ruptured scar is that the signs and symptoms are often extremely slight and are not seldom absent altogether. The explanation is not far to seek; instead of the whole thickness of the uterine wall being torn through, only a membranous and avascular scar has yielded; instead of sudden rupture being determined by powerful and prolonged uterine action in an exhausted patient, the rupture often occurs quietly and gradually during pregnancy or the early stage of labour. The membranous scar yields at one point, a small bag of membrane bulges through, and the patient goes into labour, as it were, through a gradually yielding scar until the ovum is born into the peritoneal cavity. The severity of the symptoms is naturally dependent on the position of the placenta. If the placenta is implanted over the scar, hæmorrhage is likely to be very severe; if the placenta is well away from the scar, it separates and is expelled into the peritoneal cavity with very little more hæmorrhage than occurs after a normal third stage of labour. In cases where the rupture is partial and the ovum is still in the uterus acute symptoms are obviously not to be expected. In some cases a partial rupture, sometimes only a small perforation, has been quite unexpectedly discovered at a repeated Cæsarean section. If the placenta is over the scar, even a small perforation may be accompanied by considerable intraperitoneal hæmorrhage. Apart from the type of rupture—i.e., whether complete or a mere perforation—in 6 of the reported cases symptoms were entirely absent and in 14 they were extremely slight. Three cases of complete rupture, accompanied by escape of the fœtus and placenta into the peritoneal cavity, with extremely slight and misleading symptoms, may be quoted as examples. In Munro Kerr's case the absence of symptoms caused a mistake in diagnosis; there was no collapse, only a slight alteration in pulse-rate, and slight abdominal pain and tenderness. In Breitstein's case the only symptoms were slight pain and a feeling of weight in the lower abdomen, worse on standing. In Novak's case there was no intraperitoneal hæmorrhage or shock; there was diffuse abdominal pain for a few days, after which the patient was comparatively comfortable, walking about with little inconvenience.

The Frequency of Rupture.

Upon this all-important point we possess, up to the present, no reliable information.

Harrar, reviewing the records of 50 repeated operations at the New York Lying-in Hospital, found two partial and two complete ruptures of the scar. Spalding states that of 40 patients who had Cæsarean sections in his clinic or in his private practice, only one patient, to his knowledge, had had spontaneous labour later. This patient, after one spontaneous labour, got rupture of the scar in her next pregnancy. Jolly refers to his case as the third during the last 30 years at Olshausen's Clinic. Asa B. Davis states he had had only 9 ruptured scars out of the 360 Cæsarean sections he had done (? personally). These figures, interesting as they may be, throw no light whatever on the actual frequency of ruptured Cæsarean section scars.

The only way of arriving at the truth is to get the subsequent obstetric history of a large number of Cæsarean section patients, and this forms the subject of Part 3.

3. RESULTS OF A FOLLOW-UP INQUIRY.

This section deals with the results of a follow-up inquiry into the subsequent history of a series of Cæsarean section patients operated on between 1912 and 1918. I was, of course, especially concerned about the five cases of rupture at the London Hospital, and was anxious to find out what proportion these cases bore to the number of our Cæsarean section patients who subsequently became pregnant. This meant a follow-up inquiry. The difficulty was to decide how far back to go in selecting a year for the beginning of the period of inquiry. It was useless to go too far back, as there would be a small chance of getting hold of patients who had their operation at too remote a date in a class that changes its abode so often. I decided on the period 1912 to 1918. The results of this inquiry would give the frequency of ruptures at the London Hospital, but it would not give a reliable figure for the percentage of ruptures in general, for the London Hospital cases were only a small sample selected from the mass of cases throughout the country. Further, it was a special sample, in that it contained, without a shadow of doubt, a high proportion of cases of ruptured scar. A much larger and more mixed sample was necessary. So, to begin with, I decided to add to the London Hospital cases the cases from the City of London Maternity Hospital, taken over the same period; in the latter hospital there had been no case of ruptured scar.

These combined figures work out as follows:—

Total number of Cæsarean sections (excluding fatal cases, sterilised cases, and cases of repeated Cæsarean section where the first operation was performed prior to 1912)	112
Number of patients who were followed up	84
Number in whom no subsequent pregnancy occurred	49
Number who subsequently became pregnant	35

Results of pregnancies:

Delivery by natural passages	10	Pregnant now	4
Repeated Cæsarean section	15	Rupture of the scar	5
Abortion	5		

These depressing figures show that 5 pregnancies out of 30 (i.e., after deducting abortions and patients in the early months of pregnancy), or 16 per cent., resulted in rupture of the scar, and that there were half as many ruptures as deliveries by the natural passages. They further show an unexpected degree of sterility following the operation.

Leaving now the main line of argument for a moment, I will refer to an objection which can be raised against these figures; it is that the follow-up failed in 25 per cent. of the patients, and that some of these patients may have become pregnant and may have got ruptured scars, or have had spontaneous deliveries, or what not. My own conviction is that these patients either did not become pregnant or had early abortions. If they had been expecting confinements they would almost certainly have sought the advice of their hospital, except in the few cases where they had left London. If all patients had been successfully followed up the only result would have been the recording of a still higher percentage of sterility.

To return to the main argument, it was essential to take a much larger sample of cases than that taken from the London and City of London Maternity Hospitals if the figures were to be statistically reliable. As it seemed of such immense importance to get at the truth, I decided to try and get the results of Cæsarean sections done throughout the country during the same period. I therefore wrote to many obstetric surgeons in active hospital practice, asking them to collaborate with me in a collective investigation. This investigation has been a complete success, in that we are in possession of the subsequent obstetric history of 1103 cases of Cæsarean section (including the London Hospital and City of London Maternity Hospital cases already referred to) performed between the years 1912 and 1918 inclusive.

Result of the Collective Investigation.

In Table I. are displayed the number of cases and their sources, together with the number followed up, the number that subsequently became pregnant, and the mode of termination of the pregnancies. The suture material, as used in the total number of Cæsarean sections, is also shown.

The table may be summarised as follows:—

Total number of Cæsarean section patients (excluding fatal and sterilised cases, and cases of repeated Cæsarean section where the first operation was performed prior to 1912)	1605
Number followed up	1103
Number in whom no subsequent pregnancy occurred...	616
Number who subsequently became pregnant	487

Results of pregnancies:

Delivered by natural passages	78	Abortion	47
Repeated Cæsarean section	352	Pregnant now	86
		Rupture of scar	18

The discrepancy between the number of pregnancies and the number of patients who became pregnant is, of course, accounted for by the fact that some patients became pregnant more than once.

TABLE I.

—	Total patients.	Number followed up.	No subs. preg.	Subs. preg.	Results of pregnancies.					Sutured with—		
					Del. nat. pass.	Rep. Cæs. sec.	Abort.	Preg. now.	Rup. of scar.	Cg.	Sk.	Sw.g.
St. Mary's, Manchester	243	190	96	94	4	79	13	21	1	188	1	0
Q. Charlotte's Hosp....	175	88	49	39	8	24	5	7	0	3	70	[illegible]
Glasgow R.M. & W.H.	143	82	40	42	5	31	5	4	1	36	31	0
Liverpool Mat. Hosp....	142	83	30	53	8	38	2	12	3	82	0	0
Jessop Hosp. ...	128	105	64	41	8	37	3	2	4	84	30	0
Leeds Mat. Hosp.	93	63	35	28	2	30	2	6	1	63	0	0
London Hosp.	65	52	29	23	5	12	2	2	5	25	22	5
St. Bart.'s Hosp.	59	22	10	12	5	11	0	1	0	0	0	25
Guy's Hosp. ...	57	45	18	27	7	13	3	6	0	40	[illegible]	0
Middlesex Hosp.	56	36	22	14	4	10	3	2	1	21	14	0
Mr. F. Jordan	50	43	29	14	[illegible]	7	0	[illegible]	0	43	0	0
City of London M.H.	47	32	20	12	5	3	3	2	0	1	27	4
Edinburgh ...	46	38	27	11	1	8	0	3	0	12	27	0
Gen. L.-I. H., York-rd.	46	28	20	8	0	7	0	2	0	3	15	7
St. Thomas's Hosp....	44	27	15	12	4	7	1	2	1	17	10	0
Leeds Gen. Infirm.	41	38	22	16	5	12	1	3	0	38	—	—
Rotunda Hosp.	40	28	14	14	4	6	0	5	1	2	27	0
Mr. F. Edge ...	36	25	15	10	1	7	1	1	0	25	0	0
Dr. B. Whitehouse	30	20	13	7	0	3	3	2	0	20	0	0
St. George's Hosp.	16	14	13	1	0	1	0	0	0	0	0	14
Mr. C. Martin	15	15	13	2	0	2	0	0	0	12	3	0
Westminster Hosp....	11	11	9	2	0	1	0	1	0	0	11	0
Dr. B. Solomons	8	5	4	1	0	1	0	0	0	5	0	0
Mr. Darwall Smith (private)	7	7	7	0	0	0	0	0	0	0	0	7
Womens' Hosp., Birmingham ...	7	6	2	4	2	2	0	0	0	6	0	0
Total	1605	1103	616	487	78	352	47	86	18	731	288	70

A good many interesting points could be worked out from the lists of cases I have had sent me; for example, the sterility rate that follows Cæsarean section. But here I intend only to work out two—viz., the frequency of rupture and the suture material. (The publication in full of the lists of cases will give anyone who so wishes the opportunity of working out other points, or for checking my own results.)

The Frequency of Rupture.

Out of the 487 patients who became pregnant 18 (or 3·6 per cent.) got ruptured scars. This figure does not represent the true frequency of rupture; it is necessary to know the frequency of rupture amongst the pregnancies that went to, or near to, term and were therefore liable to get ruptured scars. Adding together the repeated Cæsarean sections, the deliveries by the natural passages and the ruptured scars, we find they come to 448. The true frequency of rupture is 18 in 448, or 4 per cent. It is also interesting to note that the proportion of ruptured scars to successful deliveries by the natural passages is 18 to 74, or 1 to 4·3.

The Suture Material.

Out of 1089 Cæsarean sections in which the suture material is noted (see Table I.), in 731 catgut was used, in 288 silk, and in 70 silkworm gut. The frequency with

which these suture materials was used in general works out at 67 per cent. catgut, 26 per cent. silk, and 6 per cent. silkworm gut (incidence of catgut to silk equals 1 in 2½).

In the cases of ruptured scar catgut was used in 15 cases, silk in two, and in one case there is no record of the suture material. In no case was silkworm gut used. The frequency with which the suture materials was used in cases of ruptured scar works out at 88 per cent. catgut, 12 per cent. silk, 0 per cent. silkworm gut (incidence of catgut to silk equals 1 to 7). The number of silkworm gut cases is, of course, too small to draw conclusions from. It is thus apparent that the incidence of catgut to silk in cases of ruptured scar is nearly three times its incidence in Cæsarean section in general. From this it might be inferred that scars are nearly three times as liable to rupture after the use of catgut as after the use of silk.

But to this conclusion a reasonable objection may be raised. It may be urged that perhaps very few cases of pregnancy followed the use of silk compared to the number that followed catgut.

For example, if only 10 or 20 cases of advanced pregnancy or labour occurred amongst the silk cases silk would come badly out of the ordeal, with two ruptures to its credit. This objection can quite easily be met and overcome. It is necessary to find out the proportion of ruptures to advanced pregnancies amongst the silk cases and compare it to the proportion of ruptures to advanced pregnancies amongst the catgut cases. This information is set out in Table II. :—

TABLE II.

—	Repeated Cæs. sect.	Delivery by nat. pass.	Rupture.	Total.
Catgut	237	49	15	301
Silk...	72	19	2	93
Silkworm gut	15	6	0	21

This shows that 15 ruptures occurred in 301 cases of advanced pregnancy (i.e., repeated Cæsarean section, plus delivery by the natural passages plus rupture) after the use of catgut, a proportion of 1 in 20; and that two ruptures occurred in 91 cases after the use of silk, a proportion of 1 in 46·5. That is about 2 per cent. of the silk cases, and 5 per cent. of the catgut cases were followed by rupture in subsequent pregnancy.

The liability to rupture after catgut is, therefore, nearly two and a half times the liability after silk. Put in another way, if silk had been used instead of catgut in the above 301 catgut cases, and ruptures had occurred in the same proportion as for the silk cases, there would have been only six ruptures instead of 15, and the total number of ruptures for all cases would have been reduced from 17 to 8.

From the facts revealed by these figures there can be no doubt that catgut is a dangerous suture material for Cæsarean section, and henceforth should be discarded.

CONCLUSIONS.

(1) The frequency of rupture of the Cæsarean section scar in subsequent pregnancy or labour (abortions excluded) is 4 per cent.

(2) The cause of ruptured scar is imperfect healing, leading to a thin scar in which muscular union has failed, and which consists of little more than peritoneum and decidua with a varying amount of intervening fibrous tissue.

(3) All thin scars stretch during pregnancy; rupture of a thin scar may be determined solely by the intra-uterine tension of normal pregnancy or by the uterine contractions of normal labour; or it may be favoured by various accidental factors, of which the chief is insertion of the placenta over the scar, with partial separation of the placenta, and retroplacental hæmorrhage.

(4) Other accidental factors are over-distension of the uterus, prolonged or obstructed labour, operative interference, such as internal version, the insertion of hydrostatic bags, and the administration of such drugs as pituitrin.

(5) In the reported cases rupture occurred almost as often during pregnancy as during labour (in proportion of three to four); and many cases have been reported as early as the seventh month of pregnancy.

(6) The chief cause of imperfect healing is infection of the uterine wound; other causes are imperfect methods of suture and the employment of unsuitable suture material.

(7) As regards the suture material, catgut should not be used, for the liability to rupture after catgut is two and a half times the liability after silk. For theoretical reasons silkworm gut is the most suitable material.

(8) As regards the incision, the scar of the transverse fundal incision is especially liable to rupture. Only one case has so far been reported of rupture of the scar of the cervical incision.

I wish to tender my most sincere thanks to my fellow obstetric surgeons in the British Isles who have so generously responded to my call for a collective investigation. The collection of these lists has occasioned an immense amount of careful work to those who have undertaken the task. It is the utmost gratification to me, as I am sure it is to them, that our work has met with success and has revealed so many outstanding facts about a subject of such great importance to us all.

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Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF

TRAUMATIC DISPLACEMENT OF LUMBAR VERTEBRA:

RECTIFICATION AFTER TWELVE YEARS.

BY C. WESTMAN, M.R.C.S. ENG.,

MEDICAL OFFICER IN CHARGE OF THE MASSAGE AND ELECTRO-THERAPEUTIC DEPARTMENT, GREAT NORTHERN CENTRAL HOSPITAL.

THE following case indicates the value of X ray examination in cases of obscure backaches before resort to manipulative treatment. Treatment can then be rationally directed to the lesion at fault, and valuable time saved.

History.—H.E., 28 years old, fell down eight or nine stone steps during Easter, 1908. She was able to get up unassisted and to walk, but felt great pain in the lower lumbar and sacral region, particularly in attempting to stoop or lift anything. She stayed in bed for 36 hours and was unable to turn herself, or even half sit up She then returned to her nursing duties, but although the back pain was bearable it was persistent and only gradually began to settle down. The stiffness and pain—which have been more or less present ever since—was particularly pronounced during 1909, when it made itself felt in several acute attacks of a severe nature. Treatment by heat and massage only gave temporary relief. The condition became worse in the latter half of 1918, when the trouble seemed to spread

to the upper part of the back. At the end of that year the neck and shoulders also began to be stiff and painful—chiefly on the right side. There was aching when sitting down, even for a short time, and difficulty in standing upright. The general condition naturally suffered by the continuous aching, and frequent spells of sick leave were needed. The back, however, did not improve, but went from bad to worse during the end of 1919.

Examination, Feb., 1920.—There were great tenderness and irritability of the lumbar muscles, chiefly on the right side. In standing the left shoulder was held higher than the right, the whole body tending to lean towards this side. The hips were level. When stooping, which was accompanied by great pain and which could not be done as far as the horizontal plane, there was marked deviation of the trunk to the right in a manner which is never seen in cases of lateral curvature of the spine, not even of the severest type. This deviation was also present when lying down. In fact, the greatest difficulty was encountered in trying to put the patient in a straight position. When standing, side-bending of the trunk to the right was comparatively easy, but almost impossible to the left. There were also stiffness and pain in the cervical region.

X ray examination.—A X ray plate of the back (Fig. 1), which had been taken by the recommendation of Dr. H. C. Cameron on Jan. 1st, showed a local bend of the spinal column between the third and fourth lumbar vertebræ in a manner which I think can only be explained by forcible locking between the articular processes of these vertebræ, which presumably happened at the accident 12 years ago. The lower articular process of the third vertebra has a relation to the fourth articular process, which could scarcely by itself be brought about in a normal side-bending motion.

The malposition of the third lumbar vertebra, in addition to an associated irritation and contraction of the erector spinæ muscle, sufficiently explained both the general stiffness and the lateral deviation of the back.

Treatment.—Manipulative treatment began on Jan. 15th in the form of mobilising movements, partly general for the spine and partly directly aiming at freeing the abnormal adherence between the third and fourth lumbar vertebræ. In addition, general back massage was given for easing the pain and rendering the muscles more supple. The result was complete correction of the faulty position, confirmed by an X ray plate taken on March 3rd, which shows a completely straight spine. The correction was probably

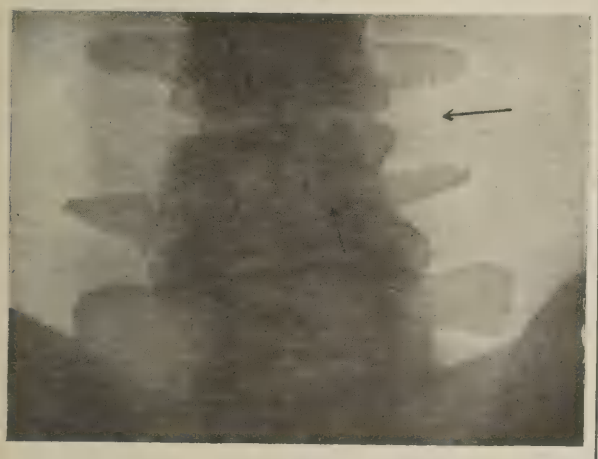

FIG. 1.—Radiogram of the lumbar spine of H. E. before rectification. The upper arrow indicates the interval between L. 3 and L. 4, the inclination here (obtained by measuring the angle between the lines, joining the tips of the transverse processes) being 6·5°, and that between L. 4 and L. 5 practically nil. The lower arrow indicates the unusual relation of the articular processes.

gradual at first, judging from the steady improvement in executing the stooping exercises, which were done with less and less deviation from Jan. 19th. On Feb. 20th, however, while passively stretching the spine, a distinct "snap" was heard by both patient and operator, the former also having a "sensation of something slipping into a different position" in the lumbar region; this, in all probability, meant that the vertebræ were finally unlocked. After this occurrence there was a sensation of relief and greater freedom of movement in the back, and soon after the bending-down movement from a standing position with straight knees could be done to normal range, with fingers easily touching the floor and without any lateral deviation. The nocturnal rest, which had previously been much disturbed—probably from difficulty in getting into a comfortable position—improved greatly.

Comment.

To verify the fact that the original malposition of the third lumbar vertebra was traumatic and not merely postural, and in view of the fact that other arthritic changes in the vertebral articulations were present, an X ray plate was taken (Fig. 2) of a normal spine, in a position of side flexion. The subject, a female, aged 35, lying prone, was instructed to bend herself over to the right side as far as she could. The figure confirms the fact that the lumbar spine permits of a considerable amount of side flexion, and it is interesting to note how evenly distributed the bending is along all the lumbar vertebræ without any exaggerated approximation between any special two of them. Mr. J. M. Redding—to whom I am indebted for the X ray plates—stated in his report

FIG. 2.—Radiogram of the lumbar spine in a normal subject (female, aged 35) lying prone, with the maximum active lateral bend. The inclination between L. 2, L. 3, L. 4, and L. 5 is 7°, 8° and 6° respectively.

of Jan. 7th that "there are fairly well-marked osteo-arthritic changes in both knees and fairly advanced osteo-arthritis of lumbar spine at junction of fourth and fifth vertebræ." It would be interesting to know if this condition is a separate one, or whether it is secondary and dependent upon the malposition of the vertebræ, giving rise to trophic changes from pressure irritation of nerves.

Patient now states there is less pain, apart from movement. She can now stand and lie straight, rests better in bed, and appetite and sleep improved.

I wish to express my gratitude to Dr. Cameron for permission to publish this case.

A CASE OF

IDIOPATHIC ATONY OF THE BLADDER.

BY S. M. VASSALO, M.D.,

UGANDA MEDICAL SERVICE.

THE following case of atony of the bladder is of interest, not so much from the clinical as from the pathological point of view.

W., native male, aged about 50. Was admitted into hospital on Feb. 12th. Patient was in great pain and complained that he had not passed water for a fortnight. On examination there was a marked median abdominal swelling reaching to the umbilicus, and a certain amount of incontinence shown by dribbling. The temperature was normal, pulse good, respiration slightly increased. A history of gonorrhœa was obtained, but the patient gave conflicting accounts of the date at which he suffered from this disease. Naturally obstruction, due to stricture, was first thought of, but this was soon excluded as a No. 9 E. catheter was passed without the slightest difficulty. At the first sitting 2½ pints of urine were withdrawn; there was pus in the urine, which was very foul and offensive.

Treatment.—The following routine treatment was adopted. The bladder was washed out twice daily, after the urine had been

withdrawn, with a weak solution of sodii bicarb. and ac. boric, a certain amount being left in after each washing. Internally patient was given urotropin and a mixture of liq. ext. ergot and tr. nucis vomicæ, the object of the latter being to increase the contractility of the bladder. The general toilette of the body was also attended to. On the 16th the urine was much clearer, but there was no improvement in the tone of the bladder; the dribbling had, however, ceased, which showed that the sphincter vesicæ was acting better. There was no improvement for another four or five days, until on the 21st the patient passed about six ounces of urine. The flow was, of course, very weak, and the act of micturition on this occasion occupied about ten minutes. From that day onwards improvement, though gradual, was very steady, and now (March 3rd) patient passes urine quite easily, and there is no more cystitis. Unfortunately, he refuses to stay in hospital any longer, and so it is rather difficult to say whether the improvement is temporary or permanent. He feels greatly relieved, and has promised to return should there be any sign of recurrence.

Remarks.

The series of events in this case does not appear quite clear. The cystitis and residual urine are easily understood, but not the sudden distension. The symptoms in this case were identical with those occurring in spinal cases, of which there were no signs whatever; moreover, in a nervous case one could not expect such marked improvement in such a short time, the bladder functioning normally, as far as can be seen, in less than three weeks. Syphilis can also safely be excluded. There was a history of gonorrhœa, but even granted that the gonococcus had migrated via the posterior urethra to the bladder, it would not produce such a train of symptoms, and the gonococcus has no special affinity for the nerves of the bladder or of any other organ. I might also add that, though frequent smears were taken from a purulent discharge at the anterior urethra, no gonococci were ever found; this, I think, will allow us to rule out gonorrhœa as the cause of the trouble.

The only literature in my possession with any allusion to this form of atony of the bladder is Thomson Walker's "Genito-Urinary Surgery," where he says that in all his cases the power of voluntary micturition remained, although greatly impaired. Further on he gives as the cause of such cases "a lesion in the lowest reflex centres of the bladder—namely, the hypogastric and hæmorrhoidal plexus of the sympathetic, ... but why such a lesion should remain confined to the bladder centre in all these cases is difficult of explanation" (1914, p. 537). For lack of a better explanation one has to accept this one just given, but I would be grateful to know if anybody who has had similar cases has arrived at a more satisfying conclusion.

A NOTE ON A

LIVING FOREIGN BODY IN THE EAR.

BY ARTHUR WOOD, M.B., B.CH. CAMB., &C.

RECENTLY a man came to see me in urgent haste, saying that he had an "animal" in his ear. Three-quarters of an hour previously he had been walking near a wall which was well warmed in the sun, when suddenly something flew into his ear from the wall. He had been syringed with water and had had oil poured in, but it had not killed the creature, for it was still making a loud and most unpleasant noise. With the aid of a syringe I easily removed a moth, which was about the size of a silver-Y; the remnants of its wings were very dark. Naturally these were frayed and almost scaleless, but it was still alive, though it had been subjected to so many and various douches. I have extracted a dead but unsuspected earwig, the patient not having the slightest idea when it got in, but I have never seen a moth, nor would I have thought it possible for the insect to get in before the man had caught it by the tail.

Rugby.

DONATIONS AND BEQUESTS.—Miss E. A. Maynard has by her will bequeathed £5000 to the Ranyard Mission, which has 85 district nurses working in different parts of London, and a similar sum to the Church of England Zenana Missionary Society.—The late Mr. W. Lewin, of Wellingborough, left £21 to his medical attendant as a token of appreciative regard.

Medical Societies.

CONGRESSES OF PHYSIOLOGY.

PARIS: INTER-ALLIED CONGRESS OF PHYSIOLOGY.

THE Inter-Allied Congress of Physiology—for the present, at least, no longer an International Congress—met at Paris from July 16th–20th. CHARLES RICHET, the learned and eloquent Professor of Physiology in the Faculty of Medicine was the appropriate President, having been appointed by the International Congress at its last meeting, held before the War in Groningen.

Presidential Address.

In his address of welcome to the members the PRESIDENT said that this was the first meeting of the Congress on French soil, to which he cordially welcomed them. He referred in elegant and appropriate terms to the memory of those workers in physiology and allied sciences whose deaths had occurred since the last meeting of the Congress. The President's message, addressed more especially to his younger listeners, was "Cherchez à connaître les choses, l'utilité viendra plus tard; c'est d'abord la connaissance qui importe." In illustration of this advice he referred to the fruitful, yet at the time seemingly unpractical, investigations of Claude Bernard on the sugar-forming function of the liver. In the same connexion he spoke of his own researches on anaphylaxis—a word coined by himself—a condition which has found abundant application in practical medicine and therapeutics. His first investigations were carried out with Portier on board the yacht of Prince Albert of Monaco when on a scientific voyage to South America, the experiments being made on birds with the poisons obtained from certain sea anemones living in tropical waters. The President concluded by the reflection that there were three great problems confronting physiologists at the present time. First the whole question of nutrition and alimentation, including that of vitamines. This "infamous war" had shown clearly that our conceptions of the minimal alimentary ration were erroneous, and that the rôle of fats in nutrition, of which we previously had but little knowledge, was of profound importance. The mysterious nutriments known as vitamines called into serious question the physiological value of our methods of cooking. The second great problem was the physiology of the brain. For almost 40 years this subject had scarcely made any progress. Our ignorance of ideation, memory, psychic reflexes, and their localisation was almost complete. The third question was both vast and obscure—heredity, and quite pertinently the speaker asked why physiologists left this problem to botanists, zoologists, and agriculturists, and commended the study of the lower animals and microbes in this regard. By prosecuting research with ingenuity and ardour surprises and discoveries would be found both numerous and happy.

Other Communications.

Numerous interesting communications followed.

M. DOYON, of Lyon, gave a demonstration on Blood Coagulation, bearing especially on antithrombin and nucleinate of soda. The substance in the blood which prevents coagulation in "peptone-plasma" seems to be of nuclear origin, and owes its activity to specific phosphorus compounds. From plasma—from a dog injected with peptone—by heating and dilute acetic acid, there is obtained a precipitate of coagulated proteins—amongst them a nucleo-protein containing 3 per cent. of phosphorus, which is capable of preventing coagulation of the blood in vitro. It seems to be derived from the nuclei of cellular organs; in fact, from all the tissues of the dog can be obtained an anticoagulant substance identical in action with that present in dog's peptone-plasma. Blood shed directly into a solution of nucleinate of soda remains fluid, and in a few hours undergoes marked hæmolysis. The

addition of calcic chloride rapidly determines coagulation. The soda salts of all the nucleic acids possess the same anticoagulative property and oppose the action of the fibrin ferment. Nucleate of soda prevents the action of yeast on sugar and that of the liver on glycogen.

P. HEGER, of Brussels, described hypertrophy of the right heart as an adaptation to altitudes. A relative hypertrophy of the right heart has been observed in the ptarmigan living in the high Alps, and careful measurements of races of cattle acclimatised to altitudes confirm this. The cause of this relative hypertrophy is to be sought in the fact that diminution of the atmospheric pressure causes a persistent pulmonary hyperæmia, leading to overfilling of the right ventricle, a condition that can be determined in vivo by alterations visible in the electro-cardiogram in an animal placed in rarefied air. The resistance to the contraction of the right auricle and retardation of the right ventricular systole and more rapid contraction of the left ventricle can be followed.

GUIEYSSE-PELLISIER, of Paris, described the histological effects when 1–2 c.cm. of oil were injected into the trachea of rabbits or 10–15 c.cm. into dogs of middle size. The oil is immediately atomised and reaches the air cells, where it is easily found six hours after injection. After several days the globules undergo lipolysis, the pulmonary parenchyma is more or less hypertrophied, and soon all trace of oil disappears.

E. ABELOUS, of Toulouse, discoursed on secretin, whose function he regards as very wide and general, and destined to activate metabolism as a whole. Its injection augments the autolytic power of the tissues, the urine contains more salts and nitrogenous matters, the respiratory exchanges are greatly increased, the blood-sugar and the blood-cholesterol augmented, and that of the liver diminished.

J. CAMUS, of Paris, described the making of permanent biliary fistulæ, with or without cholecystotomy. To get a good result the common bile-duct must be well isolated for a considerable length and the sphincter of Oddi removed, with a lozenge-shaped part of the duodenum, before it is stitched into the abdominal wall. The duodenum is then carefully closed. Hæmorrhagic pancreatitis can be produced experimentally by injecting bile or intestinal juice into the duct of Wirsung.

J. CAMUS and G. ROUSSY, of Paris, showed dogs with experimental lesions of the base of the brain in the region of the hypophysis without injury of this organ itself. There was permanent polyuria—four or more litres daily; considerable genital atrophy; infantile penis and testes very small, with marked adipose accumulation.

According to ABELOUS and F. SOULA (Toulouse) the spleen has a cholesterinogenic function. The blood contains more cholesterol after intravenous injection of secretin, and there is no increase after excision of the spleen. The splenic vein blood in vivo contains more cholesterol than the splenic artery. Splenic pulp in suspension incubated in vitro with 2 per cent. sodium fluoride shows increase of cholesterol, the sources being chiefly cholalic acid and soaps, the transformation being effected by a ferment which is found in a filtered fluorated watery splenic solution. Amongst other organs only the liver and nerve tissue—but in much less degree—form cholesterol; the adrenals, thyroid, kidneys, ovary, and genital glands and muscles have no such power—they destroy cholesterol.

The next meeting of the congress will be held in Edinburgh in 1923.

HAMBURG: GERMAN PHYSIOLOGICAL SOCIETY.

This society held its meeting at Hamburg from May 26th–28th.

R. PLAUT, of Hamburg, showed the pelves of rabbits and guinea-pigs (9–13 weeks old) of both sexes, fed with ether-extracts of cows' ovaries. The effects were produced only with extract of the corpora lutea. The extract caused change in the form of the pelvis, which was similar to that of the adult animal; there was a widening of the upper symphysial angle, and an approach of the upper margin of the symphysis to the promontory.

R. DITTLER, of Leipzig, described a means of sterilising the female organism by a humoral method. By introducing parenterally living spermatozoa spermatotoxic substances are formed and are present in the blood; thereby it is possible to make adult female animals temporarily incapable of becoming impregnated in the normal way. In order to arrive at a sufficient concentration of the antibody at the place of meeting between the ovum and sperm—i.e., in the ovum itself—there must be several repetitions of the introduction of the antigen; the whole preliminary treatment requires at least 6–7 days. The sterility may last four months or longer, and is completely reversible. A current pregnancy is not interrupted by a corresponding sperm treatment. After several injections of large doses of human spermatozoa the animal experimented on shows the normal capacity for fertilisation with spermatozoa of its own species.

Reviews and Notices of Books.

ATLAS FOR ELECTRODIAGNOSIS AND THERAPEUTICS.

By F. MIRAMOND DE LAROQUETTE, M.D. Authorised translation by MARY GREGSON CHEETHAM, with Foreword by ROBERT KNOX, M.D. London: Baillière, Tindall and Cox. 1920. Demy 8vo. With 69 plates and figures in the text. Pp. xvi. + 180. 15*s*. net.

THIS work was prepared with the object of providing, in convenient form, an account of the anatomical facts necessary as a basis for the practice of electrodiagnosis and physiotherapy. One half of the book deals with the muscles, nerve trunks, and plexuses. Under the heading of each muscle are described the origin, insertion, action, nerve-supply, position of motor point, and the strength of the galvanic current required to cause a minimal contraction with both anode and kathode. The position of the nerve plexuses, the course and distribution of the nerve trunks, and the regions where the latter are accessible for electrical testing are indicated. Numerous plates illustrate dissections of the muscles and nerves, the position of the motor points, and the areas of cutaneous nerve-supply. Notes are added on points to be observed when testing for electrical reactions, and tables are appended giving the author's "coefficient of excitability" of different muscles and nerves. About one-third of the book is occupied by descriptions of the joints, special attention being paid to their mechanical function and range of movements. A short account is given of the motor and sensory tracts of the central nervous system and of the structure of the skin.

The atlas will be extremely useful to those who are learning electrodiagnosis and physiotherapy. The various anatomical and electrical data necessary for the study of these subjects are scattered through various text-books, while the work under review presents them in a compact form, and in addition contains original work of the author on the electrical excitability of the various muscles and nerves. The work is clearly translated and is easy to understand. To English readers the anatomical nomenclature may be confusing, but this will not impair the usefulness of the book. The translation of some terms are unfamiliar—for example, "electrical swab," by which is evidently meant "testing electrode." On p. 7 Burdock should read *Burdach*.

VERGLEICHENDE ANATOMIE DES NERVENSYSTEMS.

Die Leitungsbahnen im Nervensystem der Wirbellosen Tiere. Von Dr. Æ. B. DROOGLEEVER FORTUYN, Lector der Histologie, Reichs-Universität, Leiden. Erster Teil. Mit 116 Abbildungen im Text. Haarlem: De Erven F. Bohn. 1920. Pp. 370. 25*s*.

THIS is the first part of a work on the Comparative Anatomy of the Nervous System, projected by C. V. Ariëns Kappers and the author. It was undertaken at the request of Dr. Kappers, who will deal with the Nervous System of the Vertebrates. It is not a com-

pendium on the structure of the nervous system in the invertebrates, but the subject is something far more restricted and, in some senses, more difficult, viz., the conducting paths in the nervous system of invertebrates, which postulates a wide knowledge of the outer and inner anatomy of invertebrate structure. The author has been at immense pains to collect, sift, and put together the various and very scattered references to this subject which are to be found in the comprehensive literature which he cites. He has supplied a great want in invertebrate nervous physiology, and is warmly to be congratulated on the result of his painstaking and highly successful effort. Part of the expenses were defrayed by the Dutch Minister of Art and Sciences.

The idea of conducting paths is clearly one obtained from vertebrate anatomy and physiology, where the types of central nervous system are few, and the conducting paths—at least the peripheral—are obvious and well defined. Far otherwise is it in most invertebrates, in which it is sometimes difficult to determine what part of the nervous complex is to be called central and what peripheral. The nerves for the most part are non-medullated, and the methods for their study and distribution correspondingly restricted, although the methylene-blue and Cajal methods have in many cases proved most useful. Moreover, the fundamental conception of the independence of the neuron and the relation between neurons by contiguity and not by continuity scarcely obtains in the invertebrates, where the nerve cell or neuron may have two or more processes which anastomose with similar processes from adjoining nerve cells, scattered under the epithelium or in the walls of viscera, forming wonderful nerve nets with the cells at the nodes, permitting of conduction it may be in several directions. Nor is the nerve cell the only formed element in the invertebrate nervous system where we have the doctrine of the uninterrupted connexions of the neurofibrils propounded by Bethe. Conduction is far more diffuse—especially as seen in the cœlenterata—though each ganglion cell has only a few direct connexions with adjoining nerve cells, resulting in certain definite groups and a certain limitation in the direction of conduction. The author gives a systematic exposition of his results from porifera or sponges, which do not appear to possess a nervous system at all, to arthropoda and cephalopoda, ending with a short account of amphioxus. As a rule, cœlenterata possess a nervous system chiefly composed of a subepithelial plexus of ganglion cells, which anastomose by means of broad processes, while other processes serve for the innervation of muscle cells and others pass directly to the basal or centripetal processes of epithelial cells belonging to receptive sensory cells, something corresponding to the olfactory sensory cells in vertebrates. Even amongst what appears so well-defined a group as the "vermes," the structure of the nervous system in its different classes and orders is so little uniform that it is not possible to unfold a general type, hence the author requires about 90 pages and many diagrams to set forth what he has to expound. To the mollusca 60 pages are given, and even then the author has to admit how large are the lacunæ in our knowledge as to conduction in even the highest group—the cephalopoda. Amongst echinoderms, although we know something of their nerve reactions and intensely interesting physiology, the author is shocked that we know so little about the paths of conduction. Nor are the causes far to seek in all the five classes of this group, and so the story is soon told in 10 pages. A specially full account (over 150 pages) is given of the arthropoda, illustrated like other groups by many schemata, which are helpful in enabling the reader to follow the rather intricate connexions which obtain here as elsewhere. The sense organs come in for a careful study as the primary receptive organs for the origination of impulses.

Altogether this is a most praiseworthy and illuminating exposition of what is known of the nerve-conducting paths in invertebrates. To zoologists especially it will be welcome, and to those few physiologists who devote attention to comparative physiology of the invertebrates. What strikes one in looking over the very extensive bibliography given by the author is the paucity of memoirs bearing English or American names. In this volume is laid the foundations on which, we hope, will be built many fascinating inquiries on the nervous physiology of invertebrates, an immensely wide and almost virgin field of investigation.

DIAGNOSIS OF BACTERIA AND BLOOD PARASITES.

By E. P. MINETT, M.D. Third edition. London: Baillière, Tindall and Cox. Pp. 94. 4*s*. 6*d*.

THE intention of the author of this small volume, who is government medical officer of health in British Guiana, is "to provide a pocket reference book for use in the laboratory by students and practitioners who may not have time to consult standard works on the subject." The need for such a book is no doubt often felt by those who work in improvised laboratories, remote from large towns and libraries, and may be felt by those who, whilst within easy access to standard works, like to possess within a small compass brief descriptions of the principal technical procedures. Such a book, to be of value, must be accurate and reliable from the first page to the last; it should contain an account of the best technique for each subject it touches upon; the descriptions ought to be concise and the phraseology clear and unexceptionable; and, finally, wherever it is impossible to give at least sufficient information to enable the practitioner to carry out successfully the operations indicated the subject should be omitted.

The volume under notice fails in all these respects. With regard to accuracy, on p. 9 *B. welchii* is classed as a motile organism, though this is qualified later on p. 10 by the statement that it is often non-motile. "*B. enteritidis sporogenes*" is now generally regarded as a mixture of organisms, though the author includes it (p. 9) as a definite species. The account of *vibrion septique* omits mention of the most characteristic property of this organism—namely, the formation of long filaments in the peritoneal sac of inoculated animals. The medium recommended for the cultivation of *B. influenzæ* is blood agar, in spite of the large amount of recently published work on "altered blood" media. For the investigation of a suspected case of cerebro-spinal fever the author recommends that a throat-swab be taken; a lumbar puncture would be more to the point. Ultramicroscopic organisms are described as "substances," a term properly applied to inert matter.

These are sufficient examples of errors, omissions, and the improper use of words to indicate that the book may mislead uninstructed readers.

DISEASES OF THE NOSE AND THROAT.

Fourth edition. By HERBERT TILLEY, B.S. Lond., F.R.C.S. Eng. London: H. K. Lewis and Co., Ltd. With 74 plates and numerous text illustrations. 1920. Pp. xx. + 844. 25*s*. net.

THIS book has already passed through three editions, and by so doing has proved that its value is well appreciated. The work has grown with each successive edition, and the present volume again shows a notable increase in size. The fresh illustrations are equal in value and execution to those which they supplement, and have increased in quantity. An attractive part of this edition is that devoted to the tonsils, both the development of the structure, its pathological states, and function being carefully reviewed. Much more attention is paid to the operation of tonsillar enucleation than might at first sight appear warranted on account of its relative simplicity. But the present views of specialists in diseases of the throat, nose, and ear, are more in line with those of general physicians than was the case in previous years. Now the relatively small and soft tonsil is no longer regarded as innocuous, but the tonsil is recognised as the great portal through which much disease finds entry into the system. Hence a description as full as Mr. Tilley's is really quite advisable. There are naturally different views about such matters as paroxysmal sneezing and rhinorrhœa, and we are not quite with the author in considering the terms synonymous, or in holding that the conditions are due always to the same cause. On p. 42

we are glad to see a useful and pertinent warning against carelessness in intranasal treatment by operation and the ill-effect which may ensue. On p. 160 Mr. Tilley advocates the employment of powdered chalk as a dentifrice during the administration of mercury. This recommendation is at variance with the theory of many dental surgeons that powdered chalk is injurious by damaging the mucosa of the fang-socket and so leading to Riggs's disease.

We congratulate the author upon the suceess of his arduons task of revision, and have no hesitation in recommending his book to the practitioner as well as to the prospective specialist.

CURIOSA DE MÉDECINE.

By Dr. G. J. WITKOWSKI. Paris: Libraire Le François. 1920. Pp. 272. Fr. 6.

Dr. Witkowski is well known as a diligent seeker in the by-ways of medicine and anatomy as exemplified in art and literature, especially of Mediæval and Renaissance times. In his latest book now before us he has collected a number of odd incidents, epigrams, pictures, carvings, and the like, mainly of that kind to which is applied the term "curious" in secondhand booksellers' catalogues, but, as a whole, we cannot say that the collection is particularly interesting. Items worth noting are p. 35, a reproduction of a drawing by Louis XIII. executed at the age of 6, which certainly shows astonishing precocity, and, moreover, resembles in execution such drawings by primitive man, as, for instance, the well-known Femme au renne, of the "Reindeer Period," the art of the comparatively modern child thus reproducing the art of the childhood of the human race.

On p. 29 Dr. Witkowski gives his reasons, together with an explanatory diagram for thinking that, contrary to the expressed opinions of the 31 medical men who signed the report of the post-mortem examination on Henri IV., the mortal blow was the first and not the second. On p. 143 is a reproduction of a most interesting photograph found in a German officer's baggage of the Emperor William and the King of Saxony. The Emperor's photograph clearly shows his withered left arm, which is generally disguised in official portraits. The paralysis is due, says Dr. Witkowski, to some obstetrical injury and not to infantile paralysis. The punning latin distich on p. 227 entitled "Advice to Youth," is printed as follows:—

"Quid facies Veneris cum veneris ante?
Ne sedeas; sed eas, ne pereas per eas."

but obviously there should be a second "facies" after the word "Veneris," both to complete the hexameter and to carry on the verbal equivoque.

THE ESSENTIALS OF HISTOLOGY.

Descriptive and Practical. For the Use of Students. Eleventh edition. By Sir EDWARD SHARPEY SCHAFER, F.R.S., Professor of Physiology in the University of Edinburgh. London: Longmans, Green, and Co. 1920. Pp. 577. 14*s*.

ORIGINALLY published in 1885, now greatly expanded and illustrated by 720 figures in the text, many of them in two well-chosen colours, and several photographs, the illustrations judiciously selected or reproduced from original preparations, the whole forms an admirable conspectus arranged in 50 lessons, wherein by far the largest part is descriptive. Shorter details as to the actual "preparations" or "slides" which the text describes and elucidates precede each lesson, intended to occupy from one to three hours of practical work in a class under the direction of the teacher. The pupil is not distracted by a multiplicity of methods, for only those are recommended upon which experience has proved that dependence can be placed. So numerous and faithfully reproduced are the illustrations that a student in revising his work by glancing over the pages can through the eye rapidly cause to recur to memory the actual pictorial impressions as seen with the microscope. The illustration showing the successive effects of water and other reagents upon a red blood corpuscle—printed in red—might give a false impression, as decolorisation is so marked an effect of certain of these reagents. So also in the figures of blood corpuscles of the frog and those of amphibian erythrocytes the red is very bold and arresting, but the actual faint yellowish colour tinge in the original corpuscle is missing. In edition after edition new figures have been added, so that there are but few parts of the body corporate whose structure is not represented pictorially. The most condensed and the most difficult lessons are the four on the central nervous system, while three lessons are given to the eye, requiring 11 preparations to be made.

The Essentials contain all and perhaps more than all the student requires to meet the exigencies which befall him in his medical career.

A TEXT-BOOK OF HISTOLOGY.

Second edition. By HARVEY ERNEST JORDAN, A.M., Ph.D. London and New York: D. Appleton and Co. 1920. With 594 illustrations in the text and 4 plates. Pp. 857. 25*s*.

THE appearance of a second edition of this text-book less than four years after its publication is proof that it has found favour in medical schools. This edition has been considerably improved by the substitution of drawings for some of photomicrographs, though, even now, a few photographs of doubtful value have been retained. Another welcome addition is the section on the directions for laboratory work, which gives a very satisfactory scheme for a course of practical histology.

This text-book will fulfil all the requirements of the medical student. It is clearly written and adequately illustrated, and while it is not too long or complex, everything which it is necessary for the student to know is included.

ESSENTIALS OF SURFACE ANATOMY.

Third edition. By CHARLES R. WHITTAKER, F.R.C.S. Edin., F.R.S.E. London: J. and A. Churchill. 1920. With 17 plates of 27 figures. Pp. 80. 7*s*. 6*d*.

THIS handbook deals shortly with surface anatomy in a clear and dogmatic manner. The blood-vessels and nerves are dealt with in the first two sections, regional anatomy being considered subsequently. Cerebral topography is treated with some fullness, and Chiene's method described and illustrated. Addison's markings are employed in the abdomen. There are some small differences between the teaching in this book and that usually accepted in London, but there is room for variations of this sort. Altogether the book seems to us a reliable guide for those who wish to "get up" their human landmarks.

GREEK SCIENCE AND MODERN SCIENCE:

A Comparison and a Contrast. Being an Inaugural Lecture delivered at University College, London, on May 12th, 1920, by CHARLES SINGER, Lecturer on the History of Medicine. London: University of London Press. 1920. Pp. 22. 1*s*. 6*d*.

IN this interesting lecture Dr. Singer points out how Greek science "was from its birth inextricably interwoven with philosophy," but that modern science passed through its earlier stages of development without this relationship. Science in mediæval times was limited on every side and forbidden the right of speculation, but this limitation had a share in building up an effective apparatus for research. Ancient science came to "failure and bankruptcy" because, except in the case of mathematics Greek writers set down only their conclusions, whereas modern scientific writers record, not indeed entirely, but for the most part, their investigation processes. Dr. Singer says of a modern scientific worker's paper: "He tells us nothing of how he embarked on many different lines of work and abandoned them as unprofitable or too difficult." Surely this is too sweeping a statement; at all events, there is one case to the contrary and that is Lister, who has left on record the many trials, difficulties, failures, and lines of work in which he toiled before perfecting his system. As a general statement, however, it may pass. But with Dr. Singer's final plea we can all agree—namely, that for the record of processes. "By the amount to which our processes are clearly and succinctly recorded, by

so much do we ensure the permanence of our work, by so much can we guarantee that our successors can begin where we leave off." On p. 13 Dr. Singer makes a statement which we do not consider altogether fair. He recalls how scholars ransack Eastern monasteries or the dustheaps of Egypt for any fragment of Greek literature, but "the works of our first scientific thinker, Roger Bacon, lie here at hand, unedited, forgotten, neglected." Surely the works of Roger Bacon are now in process of editing? A scheme for so doing was certainly started in 1913, a year previous to the occasion of Bacon's seventh centenary—i.e., in 1914. A committee, with the Chancellor of the University of Oxford as its honorary president, was formed to carry out the scheme, but though the war may have put a stop to the editing it is surely not the case that Bacon's works are either neglected or forgotten.

TEXT-BOOKS ON CHEMISTRY.

A System of Physical Chemistry. By WILLIAM C. McC. LEWIS, M.A. R.U.I., D.Sc. Liverp. London: Longmans, Green, and Co. In three volumes (second editions): Vol. I., 1918; Vols. II. and III., 1919. Pp. 494, 404, and 210. 15*s.*, 15*s.*, and 7*s.* 6*d.* respectively.—This is a masterly work in three volumes presenting with some detail the modern developments of physical chemistry. The first volume deals with thermodynamics (the laws and relationships which govern the quantitative transformations of energy), the second volume with the kinetic theory (the molecular constitution of matter), and the third volume with the quantum theory (statistical mechanics). The direct bearing of certain branches of the subject on the progress of medical science is illustrated in many chapters, as, for example, in those on capillary action, colloids, and catalysts in Vol. I.; osmotic pressure, ion activities, adsorption in Vol. II.; and radiation phenomena in Vol. III. It is impossible to carry on satisfactorily physiological and biological researches without a knowledge of the principles underlying physical chemistry, and these volumes will be referred to with undoubted advantage by workers in this field.

Pharmaceutical and Medical Chemistry. By SAMUEL P. SADTLER, Ph.D., LL.D., VIRGIL COBLENTZ, Ph.D., F.C.S., and JEANNOT HOSTMANN, Ph.G. Fifth edition, revised and rewritten. London and Philadelphia: J. B. Lippincott Company. Pp. 766. 21*s.*—This text-book, intended for the use of medical and pharmaceutical students, covers considerable ground, beginning with Part I. (Elementary Physics), succeeded by Part II. (Chemistry of the Non-Metals), then Part III. (Chemistry of the Metals), and finally Part IV. (Organic Chemistry). The three authors have formed a very successful collaboration, and each is an admitted authority on the subjects which he contributes. The revisions are in conformity with modern advance, much of the new ground covered being an outcome of chemical developments arising through the war. This is particularly the case with the sections dealing with the manufacturing side of chemistry. The sections on organic chemistry show also a commendable effort to bring the book into modern lines. The carbohydrates come in for full treatment, as do the alkaloids. There is an excellent account of electrolysis and its applications. The pharmaceutical sections are based on the U.S. Pharmacopœia. The book gives evidence of labour, thought, and care, and should prove a valuable source of reference and study to pharmacists and medical practitioners in this country also.

Organic Chemistry for Students of Medicine. By JAMES WALKER, LL.D., F.R.S. Second edition. London: Gurney and Jackson. 1919. Pp. 332. 10*s.* 6*d.*—The treatment of the subject is severely chemical, and while affording a good foundation for assisting future study when the importance of a knowledge of organic chemistry dawns, as physiological and biological questions are approached, the work gives but a scanty reference to the medical significance of the substances described. Theoretical questions are entered into, constitutional formulæ form a feature, and technical operations—e.g., the distillation of coal, with a section on coal-tar—are described in some detail. All this is a good deal to force into a six months' course of chemistry, and there is always a difficulty in narrowing the subject in order to keep within the requirements of the student of medicine preparing for his first professional examination. But we quite agree with the author that the student should be made to realise that he has not done with chemistry when he has passed this examination.

JOURNALS.

Journal of the Royal Army Medical Corps.—In a paper on Sick Wastage in the August issue of this journal Colonel A. B. Soltau discusses the diseases that caused loss of service to the army in France. Of the 106,267 cases passing through certain casualty clearing stations in 1917 Colonel Soltau considers that approximately 46,500, or 44 per cent., suffered from preventable dirt diseases. Thus 25,000 had skin diseases, 10,000 of them scabies, and 10,000 inflammation of connective tissue. These diseases are pretty easily treated if discovered by careful exact frequent inspection in their early stages. If they are to be prevented men must have sufficient baths and clean underclothing. Colonel Soltau estimates that there were 21,500 cases of trench fever. Five thousand are so named, and there are, moreover, 15,000 cases reported of pyrexia of unknown origin (80 per cent. at least trench fever); from the 5000 labelled myalgia Colonel Soltau takes 3000 as trench fever, and from the 5000 cardiac and debility cases 1500 more, and thus arrives at the figure of 21,500. To prevent this high morbidity from dirt diseases he urges that in future each unit shall have a standard pattern disinfestor, where men shall simultaneously bathe, have their outer clothes disinfested, and be given clean underclothing; then "the louse and the acarus will not again play havoc." He also urges the appointment of standing boards of specialists at the bases to allot to suitable work men partly disabled. Enthusiasm carried many feeble men through enlistment; they broke down on service and drifted continually through the hospitals, unfit for the line. These standing boards proved a great success in Egypt. Amongst the same group of casualties (106,267 in all) there were 7000 venereal cases, 3000 trench feet, 258 tubercle, and 3500 each of influenza, bronchitis, and mental disease. The second part of Colonel Soltau's paper is also very important, and discusses where these cases should be treated with a minimal loss of service. He claims that in the army zone, if at all possible, is the best place. Evacuation of the sick is unfortunate in its results. The sick retained are more anxious to get well; they rejoin their own units more quickly and there become useful in a shorter time than do new men, with consequent improvement of the morale of their units. The man evacuated cost a great deal and was apt to become "hospitalised" and disinclined to return. It was well to have convalescent centres in the army zone. Thus the Fourth Army, which in the winter of 1917–18 made a C.C.S. a convalescent centre for each corps, returned to duty 20,000 men, of whom half would otherwise have been evacuated. Though holding perhaps the worst part of the line, this army kept its evacuations below those of the other armies. Men do not get quiet nowadays even in base hospitals, for these, too, are subject to hostile aircraft attack. In the same number of the journal Major Angus Macdonald states that the last epidemic of malaria in England occurred in 1857–60; that malaria prevalence in England is not regular but intermittent and depends on the presence of carriers and a mean monthly temperature of 59° or over. In 1857-59 the mean monthly temperatures at Greenwich for June, July, and August, were all over 59°, and malaria was prevalent. In 1860 the mean temperature of each of these months was under 59°, and the prevalence of malaria in England ceased. In 1917–18–19 malaria appeared in England after the mean temperature had been for a month above 60°. All were *P. vivax.*—Lieutenant-Colonel G. B. Crisp gives a quantity of useful advice as to outfit and financial conditions to officers going to Hong-Kong, which he describes as a delightful station.—Lieutenant-Colonel G. H. Younge discusses 180 cases of appendicitis which occurred in three years in his hospital at Grantham.

The Bulletin of the Naval Medical Association of Japan for June, 1920, contains an interesting article by M. Ishihara, SurgeonLieutenant-Commander, I.J.N., on the Effect of Experimental Extirpation of the Thyroid Body. From his observations on young rabbits from which the thyroid was removed the author arrived at the following conclusions: 1. Excision of the thyroid in young rabbits is followed by enlargement of the thymus, probably due to a compensatory action existing between these two organs. 2. Differing from the views advanced by Hofmeister and v. Eiselberg, growth and metabolism in rabbits are not interfered with by extirpation of the thyroid. 3. Degenerated corpuscles of Hassall are met with more frequently in the thymus of normal than in that of dethyroidised rabbits; and removal of the thyroid is not necessarily followed by enlargement of the pituitary.

FRENCH SUPPLEMENT TO THE LANCET

Under the Editorial Direction of

Professor CHARLES ACHARD, PROFESSOR OF CLINICAL MEDICINE IN THE UNIVERSITY OF PARIS. AND Dr. CHARLES FLANDIN, D.S.O., CHEF DE CLINIQUE A LA FACULTÉ DE PARIS.

FRENCH RESEARCH ON GAS GANGRENE.

BY E. SACQUÉPÉE,
MÉDECIN PRINCIPAL DE 1ÈRE CLASSE ; PROFESSEUR AT THE VAL-DE-GRÂCE.

THE appearance of numerous cases of gas gangrene in connexion with wounds received in the war has been a great surprise to French medical men. As a result of the progress of modern methods of treatment this malady had nearly disappeared from peace-time practice. The present medical generation hardly knew it except by name never having had occasion of observing it.

At the outset it created some confusion, but also a firm determination to get a nearer acquaintance with this very serious complication in order to fight it better. Based on clinical observation, these efforts have aimed above all at elucidating the pathogeny of the accidents. It was clear that the complication was of infectious nature, and it was therefore first of all necessary to find out the species of microbe which were responsible for the accidents. Once this were accomplished it would be possible to think out some specific therapy with which to meet them.

We propose to explain the researches made in the course of the war in the same order—clinically ascertained facts, pathogenic studies, specific treatment.

I. *Clinically Ascertained Facts.*

We must first briefly sum up the clinical facts in order to show what French doctors have understood under the name of gas gangrene. The complaint being previously hardly known, some mutual agreement as to the connotation of words was above all necessary.

By the name "gas gangrene" we mean an extremely grave complication of the wounds, characterised at once by local and by general symptoms. The local symptoms are essentially gaseous infiltration, œdema, deterioration of the tissues (especially muscular) with gangrenous tendency, and a characteristic smell. The importance of these great symptoms varies from case to case; hence the manifold clinical types. In addition, various types of erythema (especially bronzed), phlyctenoses, &c., may be observed.

The general symptoms are constant and are marked by extensive poisoning, characterised especially by increased rapidity and extreme weakness of the pulse, dyspnœa without thoracic lesion, earthy—sometimes icteroid—colour of the skin.

Unless treated by specific means, this very serious affection proves fatal in about 75 per cent. of cases within a day or two.

From this summary description it follows that the facts studied in France under the name of gas gangrene correspond above all with the serious forms of gaseous infection of wounds. Besides the latter there is a large number of other gaseous infections, far less serious, not accompanied by the general phenomena described above, amenable to purely surgical intervention. In view of their comparative benignity these lighter forms have been studied very much less.

The clinical picture just described had to serve as a basis to the pathogenic studies. The germs supposed to be the agents of the gas gangrene had really to be capable of reproducing the double series of symptoms—local manifestations and general intoxication.

II. *Pathogenic Studies.*

In order to get the full advantage of the progress made with regard to the pathogeny it is convenient to specify what our knowledge of the matter was before the war.

It is well known that, following Davaine in his study of "experimental septicæmia," Pasteur showed that this infection is due to the *Vibrion septique* (1877). Chauveau and Arloing (1884) then demonstrated that this same germ also existed in gas gangrene in human beings.

Clinical researches into the question then became very difficult in France, since the first effect of the application of Pasteur's principles to surgery was to render gas gangrene extremely rare.

On the other hand, in foreign countries, especially in Germany and America, the study of certain new facts was possible. Welch and Fraenkel and, following them, a number of other authors, charge Welch's bacillus (the *Bacillus perfringens* of French writers) with being the main cause. According to these works the *Vibrion septique* seems entirely wiped out as far as its influence goes.

Progress of Knowledge During the War.

Such was the state of our ideas about 1914. We are now in a position to follow their development in the course of the war.

During the first stage the predominant theory of the pre-war period was followed. *Bacillus perfringens* plays a leading part. Indeed, its importance is such that there is hardly any question of other microbes. Weinberg, Sartory and Spillman, Doyon and Yamamouchi, and Orticoni, all invariably, or nearly invariably, find the *B. perfringens*.

The second stage opens with our first work in May and June, 1915, based on the following principle: the best criterion of a pathogenic species is constituted by its ability to reproduce the malady experimentally. Now, the *B. perfringens* can reproduce the local lesions of the gangrene, but it cannot be made to produce a potent toxin. There is, therefore, reason to examine whether there are not in the gangrenous tissues other pathogenic germs which comply better with the experimental criterion.

In the great majority of cases investigations in this direction gave an affirmative answer. We found either the *Vibrion septique* or a new bacillus which was later to receive the name of *Bacillus bellonensis*. These two germs are pathogenic for animals, in vitro they provoke the formation of very active toxins, experimentally they produce lesions closely analogous to those observed in cases of gas gangrene in man.

Working on similar lines, Lardennois and Baumel then proved the frequency of the *Vibrion septique* (about one-quarter of the cases), Weinberg and Séguin also announced the existence of the *Vibrion septique* in certain gas gangrenes, and also of another germ, called by them *Bacillus œdematiens*, probably identical with the *B. bellonensis*.

In this way it gradually became clear that gas gangrene was associated with three species of organisms—*Bacillus perfringens*, *Vibrion septique*, and *Bacillus bellonensis*, acting either alone or in association. And the Inter-Allied Surgical Conference, meeting at Paris, adopted analogous conclusions:—"Among the germs met with there is reason to retain the *Vibrion septique*, *Bacillus bellonensis* (the exact relations between the *Bacillus bellonensis* and *Bacillus œdematiens* are not yet made clear), and *Bacillus perfringens*."

Confirmation of the Pathogeny Adopted.

How well founded was this conception was to be proved later by the experimental application of seropathy, thanks to the proof afforded by the "protected guinea-pig," which de Lavergne discusses in another article. It is well known that the tissues of typical human gas gangrene are always pathogenic for the guinea-pig, which succumbs on inoculation. If the above-mentioned germs are really the essential agents of the affection it must be possible to "protect" the animal, if it is inoculated, simultaneously with the gangrenous tissues, with the three serums respectively specific to each of the three germs. Experiment confirms this; inoculation with the three serums, antiperfringens, antibellonensis, and antiseptique, carried out at the same time as with the infectious product, is enough to protect the animal in 96 per cent. of cases.

It is therefore safe to conclude that the pathogeny adopted is certainly correct in the great majority of cases. The other germs described as existing in gas gangrene, such as Weinberg and Séguin's *Bacillus fallax*, are therefore of only very small importance.

To make our conception quite clear we add here the results of the analysis of 121 cases under our personal supervision. *Bacillus perfringens*, 82 per cent.; typical *Vibrion septique*, 28 per cent.; non-typical *Vibrion septique* 11 per cent.;

Bacillus bellonensis 35 per cent. The germs are very often associated in pairs.

If we limit ourselves to the facts recently discovered during the war, we need not repeat the history of the *Bacillus perfringens* and the *Vibrion septique*, as both are known from previous investigation. In particular we knew that the *Vibrion septique* is not only highly pathogenous but also highly toxic; the researches of Leclainche and Vallée had shown this.

The Bacillus Bellonensis.

On the other hand, the *Bacillus bellonensis* being a new species it is necessary to describe it briefly. It is often found to predominate, sometimes it is even the sole species of anaerobe in a rather special clinical form —viz., white erysipelas.[1] In the other forms it is more usually fairly difficult of detection in the midst of other species of anaerobe better adapted to artificial surroundings.

The *Bacillus bellonensis* is a strictly anaerobic germ. It presents the appearance of a straight or slightly curved bacillus in the organism, polymorphic in artificial mediums, slightly or not at all mobile, ciliated, sporulated (oblong or oval spores), colours easily with Gram's solution.

Cultures develop easily. In a deep glucose agar stab culture the colonies appear in 24 hours, formed of a yellow-brownish, opaque central nucleus, with a paler nimbus formed of unequal filaments easily visible on enlargement. These colonies clear up and seem to dissolve after three or four days.

In glucose broth culture is visible in 24 hours, at first homogeneous disturbance with gaseous discharge, then appearance of flocculent deposit with clearing of supernatant fluid, the whole being complete within 36 or 48 hours.

Pathogenic qualities are highly developed, especially in the guinea-pig and the rabbit. In this connexion it is useful to distinguish two types of microbe which cause fairly different lesions in the animal.

The first and most frequent type causes in life the formation of a hard and very extensive œdema; death supervenes quickly, sometimes within nine hours. Autopsy reveals a huge, tremulous, colourless, or faintly tinted œdema, infiltrating the tissues to a great distance, in some places from 1 to 2 cm. thick; gaseous infiltration and muscular lesions are slight or nil. In such cases the germs are always scarce, except at the point of inoculation.

With the second type inoculation produces a local tumefaction, gaseous crepitation, coldness of the limb, various colours (violet, livid, ham-coloured), sometimes phlyctenules. On autopsy very extensive, rose or brownish gelatinoid œdema, with slight but appreciable gaseous infiltration.

Both types are toxic, above all the first. The two or six days' old filtrates (Chamberland's candle) of cultures in a liquid medium are pathogenic for the guinea-pig and the rabbit, in doses varying according to the specimens and conditions of culture; for the guinea-pig the fatal subcutaneous dose varies from 1/600 to 1/2 c.cm.; the sole lesion that can be observed consists in an enormous colourless œdema.

The *Bacillus bellonensis*, then, constitutes a highly pathogenic, very toxic species, capable of reproducing perfect gas gangrene experimentally.

III. *Specific Treatment.*

Acquaintance with the three essential species, *V. septique*, *B. bellonensis*, *B. perfringens*, makes it possible to consider the specific serotherapy successfully.

The first attempts at serotherapy were not very effective, since they really aimed exclusively at the species mentioned at the beginning, *B. perfringens* and *V. septique*, taking no account of a third agent of capital importance, the *B. bellonensis*. It is only by applying a specific serotherapy either against all three germs or against the germ involved in each particular case that a practical result can be reached.

The preparation of the serums follows the general principles already established in bacteriology. For toxic germs it is important to prepare the animals for inoculation of the toxic products; so far, indeed, the antitoxic serums prove more efficacious (antitetanus, antidiphtheria serums, &c.). On the other hand, when germs with feeble toxicity like *B. perfringens* are dealt with the procedure in preparing the serums is far less fixed.

By way of example let us cite the preparation of the antibellonensis serum. A horse is first inoculated subcutaneously with small doses of toxin (0·5 to 1 c.cm.), and the inoculations are continued, increasing the doses progressively up to one and a half or two litres. At this point direct inoculation into the veins takes place. In this way sufficiently strong serums are obtained to protect the animals for the experiment against 80,000 to 120,000 fatal doses of toxin. There is, by the way, no technical difficulty in obtaining more active serums, it is merely a matter of doses, toxin, and time.

Similarly, for the antivibrio serum, Jouan, of the Pasteur Institute, used toxin—i.e., filtered toxic cultures. As for the antiperfringens serum, Veillon, of the Pasteur Institute, prepared it by inoculation of living cultures.

Other serums have also been used—Leclainche and Vallée's polyvalent serum (antiperfringens and antiseptique), various serums by Weinberg and Séguin (prepared against the *Vibrion septique*, *B. perfringens*, and *B. œdematiens* respectively), H. Vincent's polyvalent serum, prepared with the aid of various species of microbes met with in gas gangrene.

These various serums have been used for human patients. The really great difficulty was to know which serum was to be used in each case. In most of the cases it was decided to inject all three simultaneously, although this was evidently only a makeshift procedure. Even so, this method has given decided results, as we shall indicate below. But the discovery of some means of rapid pathogenic diagnosis was indicated, in order to get the pathogenesis and at the same time the treatment promptly on the right lines. In the last months of the war we attained this by means of the proof of the "protected guinea-pig." (See the article by de Lavergne.)

Results of Curative Serotherapy.

Without going into details at this place about the results obtained for each serum, we will simply recall those which are connected with the simultaneous application of the active serums against the *Vibrion septique*, *B. bellonensis*, and *B. perfringens*.

To take the curative point of view, 191 cases of gangrene have been treated, of which 136 were in full development and 55 at their commencement. As against 166 cures there were 25 deaths—i.e., a proportion of 13·09 per cent. For the sake of comparison it must be remembered that in the same regions the mortality in non-treated cases was about 75 per cent. It can therefore be seen in how far the curative treatment has been successful. It often operates in a really striking manner, for in a whole number of cases in which any surgical operation was undesirable, the shock of operation seeming to be bound to cause death, an energetic serum treatment brought about such an improvement that the operation could be carried out subsequently at leisure without any danger.

Results of Preventive Serotherapy.

From the preventive point of view serotherapy naturally proves itself still more powerful, and this has been the experience of a number of distinguished surgeons. Preventive treatment has been applied solely in the case of very severely wounded patients particularly exposed to gangrene (arterial wounds, extensive shattering of the buttock, thigh, &c.).

A series of wounds of the like nature, but not treated by serum, gave 7·2 per cent. cases of gangrene. Amongst the 319 cases treated preventively 4 cases—i.e., 1·17 per cent.—of gangrene were observed. Three further cases involved extensively mortified tissues (ligature, tourniquet) and were cured.

Here, again, the value of preventive serotherapy is evident, since it reduces the cases of gas gangrene to a very slight number of those wounds which are most exposed to it.

Summary.

As regards gas gangrene, French medical work has progressed along a logical and fruitful path of investigation. After having sufficiently defined the malady from the clinical point of view it went on to study the pathogeny. After having attained this it entered upon the path of therapeutic realisation by means of serotherapy, which has given the happiest results.

[1] Let us recall here the essential characteristics of this "white erysipelas," typical of the "œdematous forms" of gas gangrene. From the clinical point of view we note a considerable infiltration of hard, pale, œdema round the wound; muscular disturbances are slight, and gaseous infiltration small or non-existent, the smell is clearly perceptible. Evolution very rapid, nearly always fatal. On dissection of the member one finds enormous infiltration of pale or lemon-coloured liquid œdema, clearly marked muscular lesions, and slight, localised gaseous infiltration.

THE DIAGNOSIS OF BACTERIOLOGICAL TYPES OF GAS GANGRENE

BY MEANS OF SPECIFIC SERUMS.

BY DR. DE LAVERGNE,
PROFESSEUR AGRÉGÉ AT THE VAL-DE-GRÂCE.

DURING the war, gas gangrene was the subject of numerous works. Researches have finally culminated in a new pathogenic conception of this wound complication.

The Position attained in Pathogeny and Serotherapy.

At the present moment, indeed, gas gangrene is not considered a malady always identical with itself and having its specific microbe, but as a toxinfection with gangrenous and gaseous manifestations, which several anaerobic germs are capable of producing. Amongst these germs three are almost constantly met with, either the *Vibrion septique* or the *B. bellonensis* (or else *B. œdematiens*, very nearly related if not identical), or else the *B. perfringens*; two of these germs are often associated in the same lesion.

At the same time as the ætiology of this affection was being made clear, therapeutic serums were being prepared, an antiseptique serum, an antibellonensis serum (and an anticœdematiens serum), and an antiperfringens serum.

It seemed, then, that we were in possession of an active serum against the pathogenic germ in a case of gas gangrene. And this is undoubtedly the case, provided that it is known which is the pathogenic germ conditioning the particular case of gangrene. We have three serums at disposal, but which is the appropriate one to any particular wound? Is the gangrene caused by the *Vibrion septique*, or *B. perfringens*, or *B. bellonensis*? It is here that the importance of the diagnosis—of the rapid diagnosis—of the bacteriological form of a case of gangrene lies.

Early Bacteriological Diagnosis.

The necessity of knowing promptly which is the pathogenic germ in each case of gaseous toxinfection continues to exist in spite of attempts to get round the difficulty.

It was at first possible to believe that the aspect of the lesion and its clinical behaviour varied according to the nature of the toxinfectious agent. It certainly seems that the œdematous forms of the gangrene (the type of which is white erysipelas) are due to the *B. bellonensis*, but purely œdematous forms are rare. Mixed cases with œdema and gas are very much more common, and it is then impossible to know which is the pathogenic germ when there is association. Slight clinical variations are unable to enlighten serotherapy.

It was next believed that in this bacteriological uncertainty it was best to inject a mixture of the three serums into the patient. This is certainly a rational procedure, but the importance of an early bacteriological diagnosis is none the less urgent. For it is obviously preferable to inject nothing but the specific active serum, the dose of which may then be increased and its therapeutic power raised accordingly. For this purpose an early bacteriological diagnosis is again necessary. How to obtain it?

The usual bacteriological methods cannot, as a rule, provide a diagnosis early enough. Quite apart from the time required by the isolation and identification of the anaerobic germs that are found, there are special reasons which often make the researches in gas gangrene particularly long.

To begin with, there is the circumstance that the growth on culture media of the toxic species (*Vibrion septique*, *B. bellonensis*) is often very scanty. Now, in order to separate the microbes as a preliminary to their identification it is necessary to start with a very small quantity of the pathological product. Hence the necessity of numerous subcultures and of multiplying the examinations for fear of error.

Further, we know now that the association of the germs of gas gangrene in the same wound is very common, so much so that repeated investigation is unavoidable before it can be said that only a single species of microbe is the cause.

Lastly, we know that *B. perfringens* is very frequently found in war wounds, whilst many of these wounds present no signs at all of gangrenous or gaseous infection. So much so that the presence of *B. perfringens* does not of itself imply that this germ has played an active part in the development of the infection. We must, therefore, ascertain its power by experimental investigations, a further cause of delay.

The classic methods cannot then provide that prompt answer which alone can guide the serotherapeutic treatment of an infection which runs its course in a few days. We were therefore led to seek for another way, and it seems that the method of diagnosis by means of the use of specific serums gives every satisfaction.

Principle of Method of Diagnosis.

Let us first give the theoretic basis of the method as we have used it in conjunction with Sacquépée.[1]

The injection of a specific serum confers on the animal an efficacious, specific protection against the corresponding infection or toxinfection. Now, an emulsion of fragments of a wound complicated with gas gangrene, when injected into the guinea-pig, provokes in that animal manifestations of that affection, because this emulsion, as a matter of fact, contains one of the three germs, *V. septique*, *B. bellonensis*, *B. perfringens*. But which of these three?

To ascertain this it is enough to inject this emulsion, which is pathogenic for the control, into three animals which have received, either beforehand or simultaneously, an injection of antiseptique serum, antibellonensis serum, and antiperfringens serum respectively. It is then seen that two of these animals as well as the control develop signs of gas gangrene and die, whilst the third remains "protected." This is due to the circumstance that the experimental infection has been limited by the protective serum, and the nature of the serum indicates the nature of the corresponding germ which is the agent of the gas gangrene in that particular case.

Moreover, it may happen that the infection is mixed, and it is precisely by this method that this fact has been established. The experiment does not lose any of its precise character on increasing the number of animals protected by mixed injections of serums.

A Criticism Anticipated.

We shall describe the practical details to be adopted, but we must first anticipate a criticism.

The guinea-pig which receives a rich emulsion of a product of gas gangrene really receives a highly polymicrobic emulsion. Very numerous germs are, indeed, found in this liquid: streptococci, pneumobacilli, *B. proteus*, *B. tetani*. A priori, then, one might ask oneself whether the pathogenic action of these germs—indifferent as they are to gas gangrene—may not disturb the result of the experiment.

But there proves to be nothing in this objection. In the case of the guinea-pig neither the streptococcus, nor the proteus, nor the pneumobacillus, nor the tetanus bacillus produces any appreciable action within 24 or 48 hours, and in consequence they do not produce any morbid phenomena capable of simulating the development of gas gangrene. If, on the contrary, this polymicrobic product contains the agents of the gas gangrene, everything proceeds just as if a pure culture of one or two of these three species had alone been inoculated: appearance within the very first hours of a rapidly spreading local œdema, very marked, and growing with light crepitation from the twelfth hour, later injury to the general state and death towards the twenty-fourth hour, at latest in 36 or 48 hours. It will be noticed at the same time that the part played by *B. perfringens* in each particular case is cleared up. If the *B. perfringens* played no part at all in the gaseous infection it has no pathogenic effect; in the contrary case, it is observed that only the animals protected by the perfringens serum remain unhurt.

Practical Details of Methods.

Such is in principle the method of diagnosis by means of specific serums as applied to gas gangrene. Let us now consider the practical details of its working.

The emulsion must first be prepared, and the method is not immaterial. The favourite seat of the pathogenic

[1] Sacquépée et de Lavergne, Bulletins et Mémoires de la Société médicale des hôpitaux de Paris, Dec. 6th, 1918.

germs being the muscular tissue, this should be taken in preference to serum or cellular tissue. Moreover, in order to avoid the associated common-place germs the muscular fragment must be removed at the limit of the seat of infection. As soon as possible after removal the muscular fragment is teased in about 10 c.cm. of physiological saline. It is filtered through cotton, and the liquid is then divided into five test-tubes at the rate of 5 c.cm. per tube.

How are now the guinea-pigs to be "protected"? An injection of serum preliminary to the injection of the emulsion would retard the experiment. It is therefore preferable to inoculate serum and emulsion simultaneously after a brief preliminary contact. We take, therefore, the five tubes, each containing 1 c.cm. of emulsion. Tube No. 1 is left as it is; it will be inoculated into the control animal. To tube No. 2 we add 1 c.cm. of the antibellonensis serum, to tube No. 3 1 c.cm. of the antiseptique serum, to No. 4 tube 1 c.cm. of the antiperfringens serum, and to No. 5 1 c.cm. of each of the three serums. The whole is heated in the thermostat to 37° for 30 minutes. The contents of each tube are then inoculated into a guinea-pig belonging to a series of approximately equivalent weights.

Results.

Diagnosis is usually fairly clear after 12 hours, and after 24 hours there is no doubt at all.

In 60 per cent. of cases the result is schematic. By the twenty-fourth hour three animals are dead or dying—viz., the control and two animals inoculated with a single one of the three serums. Two are alive and vigorous, without even appreciable local lesions—viz., the guinea-pig which has received the three serums and one of those which has received a single serum. The nature of this serum indicates the nature of the pathogenic agent in the particular case of gangrene. The same serum which has protected the guinea-pig will protect the patient. Moreover, the results patent at the twenty-fourth hour are very often clear already at the twelfth, and serotherapy could have been put on the right lines from that time on.

In other cases (35 per cent.) the results are at first sight less schematic. The control dies, one of the three animals which have received a single one of the three serums dies also, and the two others survive or die slowly whilst presenting important local lesions, such as œdema, very often extensive, and gaseous crepitation. Finally, the guinea-pig protected by the three serums does not only not succumb, but does not even present any marked local phenomena.

These results must be interpreted as a case of double infection. The animal protected by the three serums has remained unharmed; two of the guinea-pigs with a single serum, having presented marked local phenomena, are only protected against one of the two infections; and the guinea-pig which is dead was not in any way protected by the serum which it had received. We have, therefore, all the elements wanted to recognise the germs associated in each case.

In 4 per cent. of cases all the animals succumb, not only the control, not only the animals protected by a single serum, but even the animal protected by the simultaneous injection of the three serums. In such cases, the rareness of which is apparent, neither the *V. septique* nor the *B. bellonensis* nor the *B. perfringens* is the cause. The gas gangrene is the work either of atypical *V. septique* or of *B. sporogenes* or some other aberrant germ.

Advantages of the Method.

The results obtained by this method of diagnosis by means of serums are parallel to those obtained by the usual bacteriological methods of separation and identification of germs. It retains the precious advantage of being infinitely more rapid and of replacing the blind method of serotherapeutic injection of the three serums by a method of seropathy in which only the useful serum or serums are injected, allowing the dose to be increased.

This method of diagnosis possesses another advantage. It gives the doctor confidence in curative serotherapy. By proving how often the guinea-pigs are efficaciously "protected" this test in medical experiment demonstrates all the benefits which the injection of the serum will confer on a patient attacked by the same infection as the guinea-pig.

Previous Contributions.

The French Supplement to THE LANCET—under the Editorial Direction of Professor Charles Achard, Professor of Clinical Medicine in the University of Paris; and Dr. Charles Flandin, D.S.O., Chef de Clinique à la Faculté de Paris—has appeared on the dates given in the following list, which sets out the titles and authors of the contributions:—

Sept. 21st, 1918: (1) The Microbic Diversity of the Enteric Fevers, by Professor Achard. (2) Post-Typhoid Atony of the Cæcum, by Maurice Loeper, Professor of the Faculty of Medicine and Physician to the Paris Hospitals.

Oct. 19th, 1918: (1) What the War has Taught Us about Tetanus, by Louis Bazy. (2) Tetanus Consecutive to Superficial Wounds and to Trench Foot: Treatment and Prevention, by Professor Raymond, Médecin Principal de 2me Classe.

Nov. 30th, 1918: (1) General Review of French Cardio-Pathology during the War, by Ch. Laubry, Physician to the Paris Hospitals, Médecin Major de 2me Classe. (2) Methods of Estimating Augmentation in Depth of Volume of Left Ventricle, by Dr. Bordet, Director of the Radiological Laboratory of the Centre of Cardiology of Professor Vaquez, Hôpital St. Antoine.

Jan. 11th, 1919: (1) Gunshot Concussion of the Spinal Cord, by Henri Claude, Professor in the Paris Faculty of Medicine, Physician to the Paris Hospitals; and Jean Lhermitte, formerly Chef de Clinique in the Paris Faculty of Medicine. (2) Contribution to the Study of the Manifestations of Emotional Shock on the Battlefield, by Cl. Vincent, Physician to the Paris Hospitals, formerly Medical Officer to the 46th and 98th R.I. and to the 44th B.C.P.

March 1st, 1919: The Surgical Complications following Exanthematic Typhus, by Dr. Paul Moure and Dr. Etienne Sorrel, Prosectors to the Faculty of Medicine, Paris, Médecins Aide-Majors de 1er Classe, Surgeons to the French Hospital at Jassy.

April 5th, 1919: (1) Nervous Complications of Exanthematic Typhus, by A. Devaux, formerly Interne of the Paris Hospitals, Médecin-Major de 2me Classe. (2) Note on the Epidemic Diseases Observed in Rumania during the Campaign of 1916–17, by Dr. Henri Vuillet, late Interne of the Paris Hospitals.

May 3rd, 1919: (1) Malaria During the War, by G. Paisseau, Médecin-Major de 2me Classe. (2) Distribution of Soldiers, Temporarily Unfit through Malaria, in Agricultural Colonies, by Professor E. Jeanselme. (3) Studies on Renal Function in Chronic Nephritis, thesis by Pasteur Vallery-Radot, reviewed by Professor Charles Achard.

June 21st, 1919: (1) Recent Work on Cerebro-spinal Fever, by C. Dopter, Professor, Val-de-Grâce, Médecin-Chef to an Infantry Division. (2) Meningococcal Rheumatism and Arthritis, by Dr. Paul Sainton, Physician to the Paris Hospitals.

Aug. 23rd, 1919: Radiological Examination of Pseudarthroses before and after Operations of Bony Grafts, by Paul Aubourg, Professor Agrégé, Cuneo's Laboratory for Radiology. (Centre for Surgery of Bones, Hospital 75, Cannes.)

Sept. 27th, 1919: (1) Dysidrosis: its Parasitic Nature, by J. Darier, Physician at the Hospital of St. Louis; Member of the Academy of Medicine. (2) The Contagiousness of Favus in Man, by R. Sabouraud.

Nov. 8th, 1919: (1) Secondary Echinococcus, by F. Dévé, Professor at the School of Medicine, Rouen. (2) A Case of Peritoneal Echinococcus, by Charles Flandin, Chef de Clinique Médicale at the Faculty of Medicine in Paris.

Dec. 20th, 1919: French Work on Ictero-Hæmorrhagic Spirochætosis, by Marcel Garnier, Physician at the Lariboisière Hospital, Paris.

Jan. 31st, 1920: (1) Some Appliances for the Examination of the Nervous and Muscular Systems, by Dr. Jean Camus, Professeur Agrégé of the Medical Faculty in Paris; Médecin des Hôpitaux. (2) The Laws of Tremor, by Dr. Léon Binet, Interne des Hôpitaux, Paris.

Aug. 7th, 1920: (1) Serum Treatment of Hæmophilia, by P. Emile Weil, Physician to the Hôpital Tenon. (2) Coagulation of the Blood: A Study of the Anti-coagulant Action of Sodium Citrate and of the Part Played by Calcium in the Blood. By Marcel Bloch, Chef de Laboratoire in the Faculty of Medicine, Paris.

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THE LANCET.

LONDON: SATURDAY, SEPTEMBER 18, 1920.

Epidemics of Eastern Europe.

Four years ago, in an introductory note to PRINZING'S "Epidemics resulting from Wars," the director of the Carnegie Endowment (Division of Economics and History) stated that the most serious human cost of war is not the losses on the field, nor even the losses from disease in the armies, but the losses from epidemics disseminated among the civil populations. That truth is being increasingly brought home to us. Dr. L. HADEN GUEST, in the first of the communications regarding his recent observations in Soviet Russia, which appeared in THE LANCET of Sept. 4th, showed clearly that all the facts which had come under his notice confirmed what had been suspected from previous evidence regarding the prevalence of typhus and relapsing fever. During the last two winters the whole of that country has been swept from end to end by these diseases, and all indications point unmistakably to their recurrence on a formidable epidemic scale in Russia during the winter which is now approaching. In our present issue he refers also to cholera, which made its appearance last year in Astrakhan and on the shores of the Caspian Sea. In former years the Volga and other great waterways of European Russia played a conspicuous part in the spread of epidemic cholera through that country and from Russia to Europe. However much credit we may give to the energy and devotion of the medical service which is being maintained by the Government of the Soviets, it is impossible to disregard the consideration that at no time probably in recent history have Russian cities been so vulnerable to this and other epidemic diseases which are carried by polluted water and nourished by every kind of insanitary circumstance. Dr. GUEST'S account of the town of Astrakhan is eloquent in this respect. Nor is the tale of formidable epidemic disease in this part of the world restricted to typhus, relapsing fever, and cholera: small-pox, always endemic in Russia, and now widely prevalent, has also to be reckoned with.

It is a good habit, on hearing of a catastrophe or impending calamity in which one is interested, to ask what is to be done about it. On the purely insular view the United Kingdom is not much concerned. We can keep these diseases out, or round up any occasional imported cases, if our public health service exercises sufficient extra vigilance, and this is certain to be forthcoming. But obviously on this matter Britain cannot afford to be insular. Even if questions of humanity are set aside, and any amelioration of affairs in Soviet Russia by outside action is dismissed as impracticable in present political circumstances, there remains the feasible and practical policy of effective epidemic prevention by international action in the border States, especially Poland, Lithuania, and Galicia. The case for this policy has often been stated, and it has recently been set out forcibly and eloquently in the letter which Mr. A. J. BALFOUR, on behalf of the Council of the League of Nations, has addressed to the civilised Governments of the world. These border States are the centre of the unsettlement of Europe at the present time; we are now fortunately within sight of peace, which should lead in these lands to that re-establishment of industry and normal conditions of life which, in view of their political and geographical position, is so vital for the whole of the world. The first condition for such settlement to be accomplished is international action, which will strengthen the resources of these States to deal with the epidemic diseases by which, from their relations with Russia, they are perpetually menaced. The most practical question at the moment is the launching of the League of Nations scheme for action in Poland and elsewhere, and with it the direction and coördination of the various offers of help in money and material which have been made by voluntary organisations, including the Red Cross agencies, which are actively engaged in preparing to take their share in the scheme. The developments of this programme are being watched with considerable anxiety by the well-wishers of the League of Nations. The Council of the League have thoroughly explored the position, with the aid of some of the best-known epidemiologists in the world; they have a reasonable and economical programme, and have appointed commissioners, but the actual work cannot proceed until they have obtained money guarantees from the different nations, which so far have not materialised, except in the case of a few countries, including Great Britain and Canada. The future of the matter may well prove, in the parlance of the day, an "acid test" of the reality of the League as a family of nations, ready to act for the common good and to protect members of the family who are threatened by disaster.

Limitation of the spread of these epidemic diseases in the border States seems, in fact, to be the one immediately feasible protective measure which can now be applied with prospects of immediate good result. By the side of it, obviously, should go every effort which, through the League of Nations or by individual sacrifice, can be made to improve the appalling epidemic conditions in Russia itself: a matter in which progress, first and last, must depend on the Government of that country. We are sure that no bona fide appeal from the Soviet Government to the nations of the world for help in organising a sanitary service, such as Dr. GUEST suggests in this week's article, would pass unheeded, and we are equally sure that practical hygienists would be found with the courage and ability necessary to undertake the formidable task involved, if satisfied that they are asked to work for a Government which will not exploit their services for its own ends, but wishes to use and support them for the health of its people. Obviously, however, we cannot at the best expect that measures for prevention of typhus, cholera, or other major epidemics in Soviet Russia can be made really effective in a year or two, so as to influence materially the immediate effect, and the extension beyond Soviet Russia, of the appalling conditions on which Dr. GUEST has supplied us with such recent and valuable evidence.

Varicose Veins.

THE September number of *Medical Science* contains an interesting review of the various methods of treating varicose veins of the lower limbs. The subject has not recently received much attention here, and it is noteworthy that nearly all the authors and papers quoted are of continental origin. This is not owing to lack of material, for the condition is as common in this country as in any other. Probably it is due rather to the fact that hospital accommodation is insufficient to admit of the treatment on a large scale of an ailment which is usually regarded as of minor importance. Yet the total amount of disability and suffering due to varicose veins must be enormous. Patients with this condition can be divided into two main classes: (1) Younger people with bunches of varicosities on the thigh or calf, usually along the course of the internal saphenous vein; (2) elderly people with œdematous legs and one or more intractable varicose ulcers. Patients of the first class are commonly told to wear a crêpe bandage or elastic stocking, neither of which is an efficient palliative. Operations are not in favour because they are believed usually to fail, and this is no doubt true if surgical interference be not exceedingly thorough. The procedure originally recommended by TRENDELENBURG—namely, ligature of the saphenous vein—is not enough. All the tributaries of the vein at the saphenous opening must be ligatured and three inches of vein removed. Even then recurrence may take place owing to the communications on the back of the thigh between the internal and external saphenous vessels. To overcome this an incision should be made over the upper part of the inner head of the gastrocnemius, through which lengths of both veins can be excised together with their communications. This operation can be successfully applied to the less severe cases, but it entails keeping the patient in bed for ten days, in itself a serious drawback. Use has accordingly been made in Germany during the war of a method which, it is claimed, combines efficiency with rapidity. This depends on the injection of a 1 per cent. solution of perchloride of mercury into the lumen of the vein at various points, as a result of which thrombosis takes place almost immediately at the sites of injection. The procedure is painless if care be taken that none of the solution leaks into the subcutaneous tissue, and it is stated that there is no risk from embolism. Should collateral veins become dilated afterwards they can be injected in the same way. Various operative procedures for the severer cases have been devised, several of which depend upon the avulsion of the vein by means of appliances passed along their lumina through incisions at either end, but such methods do not seem to be, surgically speaking, so sound as a thorough excision, even though this has to be rather extensive. The incisions are made, if possible, through sound skin, and, if need be, are extended along the whole length of the leg.

The second class of patients includes the numerous elderly women who display swollen and discoloured legs, week in week out, to despairing house surgeons in the out-patient departments of all large hospitals. With prolonged treatment the ulcers can be made to heal, but the underlying causes—varicose veins and long hours of standing in the course of domestic duties—are still present and the ulcers soon recur. Grafting from the skin at the edges of the ulcer has recently been recommended, but the artifice does not deal with the underlying cause. A more thorough method involves a spiral incision through the skin down to the deep fascia, beginning at the saphenous opening and ending behind the internal malleolus. The spiral thus consists of two complete turns. The incision must divide even the small transparent veins lying on the fascia and when the bleeding points, which are not numerous, have been ligatured the wound can be sutured. A bandage should be worn for a period after the operation. This procedure has the same objection as most others, that the patient has to remain some days in bed; but there can be no short and easy road to success in so intractable a condition, and the longest cut may prove to be the shortest in the end.

Iatro-Mathematics.

THE whole of the original articles published in a recent number of the principal Swiss medical journal[1] deal with the application of the calculus of probabilities to the elucidation of medical problems. Professor H. ZANGGER, of Zurich, contributes a brief introductory commendation, Dr. H. WEYL discusses some physical applications of the statistical method, Dr. (phil.) E. HAEMIG illustrates the statistical technique of the famous psychologist LIPPS, Professor L. MICHAUD furnishes some applications of the method to clinical data, and Professor ZANGGER concludes with some non-arithmetical examples. To the reader familiar with the writings of v. KRIES, EDGEWORTH, KARL PEARSON, BOREL, and POINCARÉ, the epistemological discussions will not reveal any fresh point of view, while the mathematical or arithmetical technique of LIPPS, not the best available at the time it was devised, has long been superseded by a far more powerful calculus the development of which we chiefly owe to Professor PEARSON and his pupils. This is not, however, to say that the articles do not contain much which all members of our faculty could read with profit and, in any event, the mere fact of publication is significant, for it is probably the first occasion on which an issue of a leading medical journal has been mainly devoted to a discussion of such topics. In this country signs have accumulated that the importance to scientific medicine of the intellectual processes subsumed under such vague headings as Mathematical Statistics or the Theory of Probability are becoming realised by the leaders of the profession. The two departments of State most directly concerned with medical research—the Ministry of Health and the Medical Research Council—employ trained medical statisticians as whole-time officers, and last year the Royal Society of Medicine honoured both statistical science and themselves by conferring the titular Fellowship upon Professor PEARSON. It may not, therefore, be inopportune briefly to indicate reasons why this rapprochement is to be welcomed in the interests of medical knowledge.

If one considers the earliest monument of scientific medicine, the body of writings bearing the name of HIPPOCRATES, the conflict of two opposing intellectual principles is discerned. In the so-called "genuine" works of HIPPOCRATES himself, particularly in the first and third *Epidemics*, and the essay on "Air, Water, and Places," we see

[1] Schweizerische Medizinische Wochenschrift, August 19th, 1920.

employed the principle which has come to be associated with the name of BACON—viz., that of assembling particular instances, of classifying them and using them as a basis of induction. But we also meet with a system of purely deductive reasoning, of inferences drawn from first principles grounded, not upon experience, but upon loose analogies. In the hands of GALEN, who has at least as important a place in the development of medicine as that of ST. PAUL in the evolution of Christianity, the teaching of HIPPOCRATES suffered a transformation. It is true that GALEN, particularly in his doctrine of temperaments, and in the discussion of the factors of what we should call epidemic diseases in his less-known work on the "Differentiæ of Fevers," developed a notation appropriate for the orderly assembling of such data as are specified in the Hippocratic books. But it is also true that he devoted the major part of his labours to a refinement of the strictly deductive method which resulted in the formulation of a quasi-infallible system the influence of which upon the minds of his successors was almost wholly bad. It is of interest to recall that the great mathematical ability of the Greeks was directed to those branches of mathematics which are most remote from the application of quantitative reasoning to aggregates of particulars such as were collected by HIPPOCRATES, that the science of mathematical probability is only a few centuries old. When, after the revival of science, a return was made to the Hippocratic standpoint, pre-eminently by SYDENHAM, it unfortunately happened that the protagonist separated himself from the good as well as from the bad schools of his age. Although SYDENHAM resumed the Hippocratic method and modelled his chief work on the *Epidemics*, he, no more than the Greek physician, grasped the true significance of the quantitative principle. The subsequent history of SYDENHAM'S ideas and of those of an obscure, non-medical contemporary, the London draper JOHN GRAUNT, is full of instruction. Intellectually, there was no comparison between the two men, yet if we inquire whose work conferred more benefit upon medical science, there can be but one answer. That of GRAUNT was far more fruitful; to it we owe, directly, our modern systems of medical and vital statistics, and indirectly, through HALLEY, the scientific development of life assurance. The less learned and less philosophically-minded man realised what the other did not realise—that to draw profit from aggregated particulars they must be quantified and ultimately brought to the test of arithmetic. The historical reason for the slowness of the rapprochement of mathematics and medicine is that the most gifted minds (with rare exceptions such as that of SYDENHAM) were occupied in amending another fault of ancient medicine. GALEN'S specification of the temperamental and procatarctic causes of diseases was, and is, of value, while profit can still be drawn from the climatological and meteorological observations of the Greeks. But ancient medicine contributed nothing of value to our intimate knowledge of specific causes. No satisfactory doctrine of *contagium vivum* is older than FRACASTORIUS, and the earlier classification of diseases were symptomatic. Of the simplification and precision, not to speak of the therapeutic and prophylactic advantages, which the researches of experimental pathologists and bacteriologists imported into medicine it is needless to speak. On the other hand, a few able physicians, such as BORELLI, BELLINI, and BAGLIVI, or our countrymen, FREIND, COLE, and PITCAIRN, who were attracted by mathematical methods, did not pursue mathematical lines which were apt to lead to the discovery of important truths.

The incompleteness of our outfit owing to the neglect of mathematical methods was not a serious practical inconvenience so long as the supply of important discoveries through the use of other tools was abundant. We could not even wish that the great pathological anatomists of the eighteenth and early nineteenth centuries and the great experimental pathologists and bacteriologists of more recent times had devoted themselves to other tasks. But it is becoming every day clearer that the methods they introduced, although of priceless value, are not omnipotent. It is now plain that the most exact specification of the materies morbi of such a disease as pulmonary tuberculosis, the most sedulous examination of its channels of entrance to the body and of its extra-corporeal distribution leaves much unexplained. We note the disparate incidence of the disease upon different occupations not subject to specific hazards, wide variations between class and class, and between nation and nation, and recall the words of GALEN, "No cause can be efficient without an aptitude of the body ..... the chief factor in the production of disease is the preparation of the body which will suffer it." But so soon as this aspect is faced, so soon as we envisage the problem of innate or acquired predisposition, the need of the mathematical tool is realised. We enter the region of probability, we have to render an account of a complex of inextricably mingled cause-groups and to deal with average results. Within a narrower circle, that of clinical medicine, the same need arises. Of those infected with the same specific organism, perhaps exhibiting the same physical signs and symptoms, some recover and some die. Or again upon a group of cases ostensibly *in pari materia* the same therapeutic agent exerts different effects. The causes of these divergences are multifold and cannot be submitted to experimental control in isolation. We have a problem comparable to that of the tossing of a penny. The direct evaluation of the force of the throw, of the resistance of the air, of the impact is impossible, we must fall back upon the evaluation of average results and their laws of distribution. The students of molecular physics have for similar reasons had recourse to the methods of mathematical probability, as Dr. WEYL points out, and it is now being appreciated that to medicine a similar application is imperative.

At present the rapprochement of medicine and mathematics is incomplete; our generation will not see many iatro-mathematicians, using better methods and aiming at more attainable ends than the iatro-mathematicians of 200 years ago; mistakes will be made both in choice of method and of material. But the rapprochement will eventually become a firm alliance and lead to the conquest of new territories. For these reasons we welcome the testimony of a changing public opinion rendered by our Swiss contemporary.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At the monthly meeting of the Faculty, held on Sept. 6th, Dr. John Brownlee, director of statistics, Medical Research Council, was admitted as an Honorary Fellow, and Dr. B. W. H. Fergus, of South Africa, was admitted (after examination) as an ordinary Fellow of Faculty.

Annotations.

"Ne quid nimis."

THE RELIEF OF DISABLEMENT: A DEBT OF HONOUR.

AT the Mansion House last week Dr. Macnamara, Minister of Labour, spoke of the approach to a final stage in the reabsorption of ex-Service men into civil life. Five million fighting men and 200,000 officers have been reinstated, and there remain some 150,000 men who still lack occupation. At least 18,000 of these, Dr. Macnamara said, are disabled. Disability is an elastic term. Scheduled disability, as the medical man knows well, does not cover all the maladjustments to the daily round which prevent a man who has been taken away from his peaceful occupation and exposed to the stress and strain of war from readily returning again into industrial life. Dr. R. Fortescue Fox, in his illuminating letter which appeared in our columns a fortnight ago, adduced even from official utterances a larger total of war disablement than that admitted by Dr. Macnamara at the Mansion House. As a result of his experience at the first treatment and training centre opened in this country Dr. Fox became satisfied that nearly 20 per cent. of the men passing through his hands must be placed in a special category as subnormal, which is to say that while possessing a good capacity for work they are at present unfit for ordinary conditions of industry. Accepting this basis, there must be at least 25,000 of the class in the country. The proportion of subnormal men likely to find their permanent vocation on the land is not very high, the majority having neither the physical strength nor the inclination for agriculture or horticulture. Should land-work alone be provided for men unable to work in towns it will mean that all over the country large numbers will either be doing nothing or going into land-work or town life only to break down and come out again—a cat-and-mouse existence. They are not agriculturists; they cannot be town workers. What is to be done with them?

The problems involved in the provision of permanent employment for disabled men are complex and difficult, demanding for their effective solution sympathetic study from social, economic, and medical standpoints. Medical considerations must loom large in any scheme which is put forward; the debt of honour, in fact, rests heavily on the medical profession, for it alone is in a position to liquidate it completely. The assessment of fitness for work and of the nature and degree of work suitable to the individual, advice and guidance as to the conditions under which occupation is feasible without risk, and even the form of employment most applicable to the particular disablement—these are definitely medical problems. One of the points of reference to the Select Committee on Pensions appointed last May was to inquire into and report upon the position as to employment and training of ex-Service men. White Paper No. 185, recently issued, defines the following classes:—

(1) Men requiring treatment such as would interfere with regular attendance at a continuous course of training on ordinary industrial lines.

(2) Men who are likely to break down or who have broken down in training or employment under ordinary industrial conditions.

(3) Men whose condition necessitates concurrent treatment and training in a convalescent centre.

(4) Men whose disability is such as to make it impossible or undesirable for them to be trained or employed in association with other workmen.

Some medical men may find an administrative classification such as this not very easy to interpret, and apparently the Select Committee recognised the difficulty, for it points out that concurrent treatment and training may be given either in convalescent centres or in orthopædic, neurasthenic, and other hospitals, where classification can then be carried out. But the accommodation at present available is still lamentably insufficient, and the provision of further accommodation is urgently recommended by the Select Committee, which regards such centres for treatment and training as of the greatest value if established on efficient and practical lines.

Only those who have been closely in touch with work among military convalescents can have any idea of its many-sidedness. In the current issue of the *Journal of the R.A.M.C.* Dr. L. Graham Brown shows that the convalescent depôt in France meant something more than re-creation or recuperation of the disabled man's physical powers; it meant what is of equal, if not greater, importance—the re-creation of his mental and moral character by placing him in an environment where spiritual influences can work their effect. Those to whom this may seem a large claim should study the rapid and inevitable deterioration seen in the disabled man who is not promptly reabsorbed into communal life. The streets of London and of other large cities in this country, and doubtless of other countries, are full of deplorable saprophytes, who are not likely to get less numerous as time goes on. Dr. Brown, whilst not undervaluing the influence of chaplains, of the Y.M.C.A., or of lectures by commandants, ascribes the curative atmosphere of the depôt chiefly to the competitive spirit built up throughout the whole work and play of the depôt by the officers in charge of it. Nothing has been shown, or is now likely to be shown, able to take the place of communal life lived at the highest level applicable to the particular disablement. An analogy may not unfairly be drawn with the admitted success of communities, many of them now long established, where the impairment is of a different character. Every county mental hospital forms a self-supporting and self-governing State to a degree which needs to be seen to be realised. Some colonies of mental subnormals make their own bread, grow their own wheat, manufacture their own ice for refrigerators in which is stored meat derived from their own farm. The hospital farm includes cattle, poultry, pigs, orchard, kitchen and flower gardens, all cared for by patients under expert supervision. There are shops for carpenters, for plumbers, for cobblers, for tailors, and many others. The hospital chapel is the size of a small village church, and a large theatre, dancing- and billiard-rooms, playing-fields, and tennis-courts complete the arrangements for recreation. The cases are not quite parallel, for in the disabled community provision must be abundantly made for wives and children, but nevertheless the county mental hospital might suggest the nucleus of a permanent centre for war disablement. The problems in each case are essentially medical, and the administrator requires a medical training in addition to his other gifts. Since it is quite impossible to assess a man's capacity for work under outside conditions before he has been trained or tried, admissions to such an institution would include a majority of men who would subsequently be able to leave and fill their place in ordinary life. The colony would retain as permanent inmates the second of the four classes mentioned in the White Paper.

THE CARE OF MENTAL DISEASE IN SCOTLAND.

WE learn from the sixth annual report of the General Board of Control for Scotland that on Jan. 1st, 1920, there were 17,432 patients on the Board's register, while on Jan. 1st, 1916, there were 18,842 patients, showing a fall of 1410. Between 1916 and 1917 there was a decrease of 181; between 1917 and 1918 a decrease of 536; between 1918 and 1919 a decrease of 524; and between 1919 and 1920 a decrease of 169. This last figure perhaps serves as an indication that the influences which produced a marked decline, especially in the number of pauper lunatics during the period of the war, are beginning to subside. The total number of patients admitted to establishments (excluding transferred patients) during 1919 was 3619, which is 226 more than in the previous year, 482 more than in 1917, 184 more than in 1916, 12 less than in 1915, and 63 more than the average for the quinquenniad 1910–14. Of private patients there were discharged recovered during 1919, 318, which is 66 more than the number in the preceding year and 105 above the average

of the five years 1910–14. The number of pauper patients discharged recovered was 955, which is 145 more than in the preceding year and 178 less than the average for the five years 1910–14. The number of private patients discharged unrecovered, excluding those transferred during 1919, was 187, which is 45 more than last year and 56 more than the average of the five years 1910–14. The number of pauper patients discharged unrecovered was 282, which is 26 less than the number so discharged in the preceding year, and is 97 less than the average for the five years 1910–14. The number of private patients who died during 1920 was 314, which is 36 less than in 1918 and 130 more than the average of the five years 1910–14. The number of pauper patients who died was 1522, which is 374 less than in 1918 and 258 above the average of the five years 1910–14. There is a somewhat remarkable fall in the admission to care in private dwellings under the boarding-out system obtaining in Scotland. The Board of Control attributes this to the general decrease in the number of pauper lunatics, to the disorganisation in the arrangements for placing patients caused by the war, to the improved financial condition of many of those who formerly received patients, and to the lack of housing accommodation. The cost of maintenance of patients per head is shown by the following interesting figures. In asylums the average weekly cost was 14*s*. 7*d*.; in the licensed wards of poor-houses, 13*s*. 8*d*.; and in private dwellings, 9*s*. 7*d*.

PRIMARY ACTINOMYCOSIS OF THE TONGUE.

PRIMARY actinomycosis of the tongue is fairly common in cattle, but is an infrequent occurrence in the human subject. Professor R. Kockel,[1] of Leipzig, records a case in a man aged 40, from whose tongue a hard superficial tumour, the size of a bean, had been removed. On microscopical examination the tumour at first sight resembled a rapidly growing sarcoma, as it consisted of a tissue rich in cells which had penetrated between the muscle fibres of the tongue causing pressure atrophy; but after serial sections had been made a central purulent focus was discovered in the middle of which a small foreign body was seen which was apparently a piece of wood surrounded by actinomycotic granules. The explanation given of the localisation of the lesion is that the patient, in order to break himself of the practice of excessive cigarette smoking, had been in the habit of chewing a wooden tooth-pick, a piece of which in all probability had become broken off and penetrated the tongue. Professor Kockel remarks that the case is of interest because wooden tooth-picks, like matches, have hitherto enjoyed the reputation of being germ-free. The case also shows that actinomycosis of the tongue in man, as in cattle, may appear in the form of a relatively benign new growth and does not always show a tendency to rapid dissemination.

THE PROBLEM OF DENTAL DISEASE.

IN the *British Dental Journal* for August 16th Dr. James Wheatley, the county medical officer of health for Shropshire, makes a valuable contribution to the subject of dental caries. Dr. W. E. N. Dunn called attention to this article in a letter last week (p. 576). For several years Dr. Wheatley has been giving, in his yearly reports, data with regard to the incidence of caries in the area under his supervision. The figures he has now furnished are based on the examination of 37,527 children before the war and 10,593 children since the war. These figures show remarkable improvement in children now at the age-period of 5 years; before the war only 5 per cent. of the children in this age-group were free from caries, whereas no less than 44·4 per cent. of post-war children showed no decay. This great improvement he attributes largely to the restriction and modification of food during the war as it affected especially sugar, bread, and milk. Children of 5 have, of course, grown up into these conditions. In the case of sugar the consumption was lessened and sweets almost disappeared for a period. The bread was modified by the addition of so-called offal to the flour and by the prohibition of the sale of new bread. This, together with the necessity of eating crusts owing to the shortness of supply in general, led to an increase in the practice of mastication. In a small measure Dr. Wheatley considers the improvement may be due to the campaign he started against dental caries, but the chief point of interest is the confirmation by figures of the belief that the cause of caries lies in the food and not in assumed constitutional conditions. In dental caries, Dr. Wheatley remarks:—

"We are dealing not with a disease which we might alleviate or to some extent prevent, but with a most powerful cause of disease and with a condition which is liable to aggravate every other disease. We have an opportunity of removing a cause of disease such as does not present itself in any other branch of preventive medicine."

A national scheme for the prevention of dental caries is badly needed, and there is already a sufficient basis of unanimity on essentials for such a scheme to be a success; but if it is to yield the quickest and best results it requires the whole-hearted coöperation of the medical profession.

THE FRACTIONAL TEST-MEAL IN RELATION TO GASTRIC FUNCTION

THE use of a test-meal for the diagnosis of gastric diseases is well known, and considerable interest, at times lighting up into controversy, has been aroused over this subject. There is little doubt that the Ewald test-meal, consisting as it does of a pint of weak tea and 2 oz. of toast, provides a useful medium for the analysis of the gastric contents, removed one hour after the meal has been consumed. The methods of analysis are capable of yielding accurate results, but it is obvious that our interpretation of such results is at fault. There are so many factors concerned in the secretion of gastric juice—viz., (*a*) nervous control; (*b*) blood-supply; (*c*) alteration in the secretory cells lining the stomach; (*d*) pyloric sphincter control over the emptying of the stomach—and these are not taken into consideration. This applies more especially to the Ewald test-meal, as we have a single analysis at the end of an hour's stay in the stomach on which to base our conclusions. Rehfuss[1] in 1914 devised a method of obtaining small quantities of the gastric contents at given intervals, thus enabling us to follow the whole course of digestion of a test-meal, and the variations met with both in health and disease. The method has received considerable attention in America, if one may judge from the numerous publications made by Rehfuss and his co-workers. Dr. C. M. Wilson alluded last week to the investigations at the Johns Hopkins gastro-intestinal clinic under Dr. T. R. Brown. The results of the application of this method of investigation of gastric function are far-reaching, and the method promises to become universal. It is simple to apply, and less unpleasant to the patient than the large stomach-tube and evacuator.

The use of the fractional test-meal has demonstrated very forcibly the fact that hyperchlorhydria is not such a definite pathological condition as we have been led to assume in the past. A large number of normal individuals show quite as definite a hyperchlorhydria as was previously considered to be pathological, and this gastric response applies to all varieties of foodstuffs. The discussions which followed papers read before the annual gathering of the American Therapeutic Society in May last fully emphasised this finding. It is quite clear from the observations made at this meeting that no one was able clearly to define hyperchlorhydria. Each individual varies in his gastric response to food, and the gastric mucosa may secrete an excessive amount of hydrochloric acid without any symptoms of hyperacidity. Dr. Julius Friedenwald, in discussing the treatment of hyperchlorhydria, considered that four ætiological factors were concerned in its production, and until the cause was discovered no proper

[1] Münchener medizinische Wochenschrift, Sept. 3rd, 1920.

[1] Rehfuss and Hawk: Jour. Amer. Med. Assn., 1914, lxiii., 11.

therapeutic measures could be instituted. The four ætiological factors were:—

1. Primary disturbance of the gastro-intestinal tract—e.g., ulcer, pyloric obstruction, acid gastritis, atony, and chronic constipation.
2. Constitutional and organic diseases—e.g., cholelithiasis, nephrolithiasis, chronic appendicitis, chlorosis, cerebro-spinal lesions, abdominal adhesions, and genito-urinary infections.
3. Nervous affections—e.g., mental strain, overwork, worry, neurasthenia, hysteria, and mental conditions.
4. Disturbances of the endocrine glands.

Dr. W. Wayne Babcock advocated the operation of cholecystogastrostomy to relieve cases of hyperchlorhydria, especially in those where the use of therapeutic measures have not given permanent relief. He considers that the pyloric area of the stomach suffers most from the irritation of the acid gastric juice and that the introduction of bile into this area relieves the irritation and prevents the formation of peptic ulcers. Dr. Rehfuss, in the discussion which followed, outlined his views, which were based on the results of his method of analysis of the gastric functions. The presence of hyperchlorhydria in people with no symptoms, and as high as that found in pathological cases, showed conclusively that it was not the quantity of acid which accounted for the symptomatology of this condition. On this account he could not conceive that direct communication between the gall-bladder and the stomach would benefit hyperchlorhydria. Reyfuss and Hawk[2] have recently summarised the results of their work on this subject. They have obtained a vast amount of experimental data, particularly as regards the normal gastric output both during gastric activity and rest. The variations met with in health must be clearly defined before any interpretation is placed upon the gastric analysis in disease. Besides the fact already noted that a number of normal individuals show a hypersecretory response to all classes of foodstuffs, they find that there are both fast and slow responses in the normal individual. The curve of gastric secretion is made up of psychic and chemical secretions, and by means of the new method these can be separately determined as well as the secretion in the fasting stomach, and also the amount of duodenal regurgitation. For an analysis of gastric function they use the Ewald test-meal, and divide the gastric responses met with in disease into four groups.

1. Clean digestion, showing simple secretory variations.
2. Secretory variations plus gastric mucus, indicating inflammation of the mucous membrane.
3. Secretory variations plus blood (intragastric) indicating ulceration of the mucous membrane.
4. Secretory variations plus blood, pus, mucus, and bacteria, indicating ulceration and infection of the mucous membrane.

They conclude that there is no specific curve in any gastric condition, and all that can be said is that disease may produce definite types of secretory and motor alterations.

Dr. J. A. Ryle's paper, published in THE LANCET of Sept. 4th on the investigation of gastric function, embodies a considerable amount of work on normal individuals, and represents a laudable attempt to analyse the factors concerned in gastric secretion. Hitherto this method of the fractional test-meal has not been taken up in this country, and we hope that Dr. Ryle's paper will receive the attention it deserves. He fully confirms the work of Rehfuss and others, and is able to give further information. The effect of different types of meal on the secretory curve is well shown in the curves, and demonstrates very clearly that in this method we have a ready means of studying the normal physiology of the stomach. A comparison of these curves with those found in pathological conditions is instructive, particularly the high acidity of the resting juice, the steep curve, and the continued secretion in the duodenal case (Chart 4). The method would appear to have almost unlimited applications, both in physiology and clinical medicine. Not only can we estimate the responses from the point of view of motility of the stomach, but the time relations of pain and other symptoms can be determined, also the local effects of drugs. The presence of pathological elements can be readily detected, and the presence of regurgitation of intestinal contents at the end of gastric digestion. The method, therefore, provides abundant data for the logical interpretation of gastric analysis. Further research is needed, especially upon the factors which produce alterations of function, as well as the appearance of certain pathological elements. The fact that carcinoma of the stomach in its early stages gives rise to very little disturbance of function emphasises the importance of such investigations.

[2] Reyfuss and Hawk. Jour. Amer. Med. Assn., 1920, lxxv., 449.

NEUROBLASTOMA SYMPATHICUM.

Dr. P. C. Gunby,[1] of Rochester, Minnesota, records an example of this rare condition, the clinical diagnosis of which was confirmed by post-mortem examination. The patient was a boy, aged 13 years, who was brought to the Mayo Clinic for relief of failing vision, weakness, and small tumours of the scalp, which had first appeared six months previously. Examination showed a well-developed boy, moderately emaciated, whose skin was very pale with a slight greenish tint. The entire forehead and vertex were studded with nodules varying in diameter from 2 cm. to 6 cm. Moderate bilateral exophthalmos was present. A smooth mass was felt in the left hypochondrium. Ophthalmoscopy revealed bilateral choked disc, and a skiagram of the skull showed a diffuse porosity suggesting the osteoclastic type of bone malignancy. On the strength of these findings Dr. Gunby made a diagnosis of neuroblastoma sympathicum, probably primary in the left suprarenal. On the other hand, the possibility of hereditary syphilis was considered owing to the presence of papules and scarring about the body, a maternal history of miscarriages, scarring about the uvula and fauces, and slight roughening of the tibiæ. Anti-syphilitic treatment was instituted, but death took place about two months after admission to hospital without much change in the child's condition. The autopsy showed a large growth resembling malignant hypernephroma of the left adrenal, numerous metastases in the bones of the skull, sternum, vertebræ, ribs, and lateral lumbar and retro-aortic lymph nodes, very extensive tumour rarefaction and softening of the skull bones, hypostatic broncho-pneumonia, marked hyperæmia and hyperplasia of the spleen. There were no metastases in any of the parenchymatous organs. Microscopical examination of the adrenal tumour and of the metastatic nodules showed none of the characteristics of hypernephroma, but the tumour cells, tangled masses of fibrils, and rosette formation associated with neuroblastoma sympathicum were present.

STERILISATION OF PRIMARY SYPHILIS.

IN a recent issue of the *Bulletin de la Société Française de Dermatologie et de Syphilographie* an account is given by Dr. Jean Gouin and Dr. L. Leblanc of the serological reactions of cases of primary syphilis undergoing intensive treatment. The writers have found that in the great majority of cases of primary syphilis with a negative Wassermann reaction (W.R.) the blood becomes positive during the course of the initial intensive treatment. This phenomenon the authors term "activation sérologique," analogous to the "réactivation de Milian" or provocative W.R. of latent syphilis. Fifteen cases of primary sore were observed. Of these 12 gave a completely negative serum reaction and 3 a partially negative one. During the course of intensive treatment a positive W.R. was obtained in all of the 12 except one. When a weak reaction was obtainable at the beginning of the course a strong positive was subsequently observed. Treatment consisted of weekly injections of novarsenobenzol up to a total of 4 to 6 g. The W.R. was performed before every injection, and sometimes twice between injections. In some cases mercury was given in addition to

[1] American Journal of Medical Sciences, August, 1920.

arsenobenzol. With regard to the period at which a positive Wassermann reaction was obtained the observations of these writers are in line with those of Levy-Bing and Gerbay. The serum reaction almost always became positive from 40 to 45 days after the infecting coitus. Too much stress is, as a rule, placed on the age of the chancre and too little account taken of the period of incubation. To obtain a truer valuation these two periods should be added together. Out of Dr. Gouin and Dr. Leblanc's observations several points of interest arise. If, in spite of the initiation of treatment at an early stage of syphilis, a positive reaction is nevertheless obtained during the course of treatment, is it legitimate to consider that we have sterilised that case? That being so, is it not desirable that repeated W.R.'s should be made during the course of treatment of every case of primary syphilis? If the serum reaction remains negative throughout, as it did in 1 out of the 15 cases mentioned, it is legitimate to regard such a case as sterilised. If, on the other hand, at any period after the starting of treatment the phenomenon of "activation sérologique" is observed the case must be regarded as one of secondary syphilis, regarded from the point of view of future treatment. The work of Dr. Gouin and Dr. Leblanc certainly suggests that fewer cases of primary syphilis are completely sterilised by early treatment than has been generally supposed.

BENZYL BENZOATE IN WHOOPING-COUGH.

IN a number of important communications Dr. David I. Macht has reported the results of investigations made at the Pharmacological Laboratory of the Johns Hopkins University, which show an interesting relation between the chemical structure of the principal opium alkaloids and their action on smooth muscle. They can be divided sharply into two groups: the pyridin-phenanthrene, of which morphine is the principal member, and the benzyl-isoquinolin, of which papaverin is the principal. The morphine group is characterised by a stimulating action on smooth muscle, increasing its contractions and raising its tonus, while the papaverin has a sedative effect, inhibiting contractions and lowering tonus. Pharmacodynamic analysis of the papaverin effect points to the benzyl nucleus of the papaverin molecule as responsible for the sedation. Dr. Macht then searched for a simpler compound of the benzyl with the sedative effect of papaverin on smooth muscle and without its narcotic effect. He found that benzyl benzoate had all the effects of papaverin on smooth muscle and was much less toxic. The therapeutic applications naturally followed. The drug was tried in excessive intestinal peristalsis, pylorospasm, uterine spasm, spasm of the gall-bladder or urinary bladder, ureteral spasm, angiospasm, and other conditions, and found effective. In our issue of Sept. 4th (p. 512) we summarised another paper, by Dr. Macht, dealing with the effects of benzyl benzoate in hiccough. The drug was also found valuable in bronchial asthma. By a fallacious process of reasoning it was used in spasmodic conditions of the larynx, such as whooping-cough, in which the muscles involved are not smooth but striated. However, as according to some authorities whooping-cough is accompanied by more or less bronchial spasm, and Dr. Macht had noted some slight sedative effect in cough, he tried it. The results, which he reports in the Johns Hopkins Hospital Bulletin for July, were unexpectedly gratifying. All other medication was discontinued and a 20 per cent. alcoholic solution was given by mouth. The dose varied from 5 to 40 drops in water three or four times a day, according to age and severity of the disease. For young patients it was flavoured with a few drops of benzaldehyde and given in sugar, water, or milk. It was soon found that the addition of benzaldehyde, in amounts varying from 1 to 5 per cent., made the mixture more effective. About 90 per cent. of the patients showed more or less beneficial effects, and about 50 per cent. marked improvement. The effects were not curative but palliative—reduction in the violence or number of the paroxysms, or both, and elimination of such sequelæ of violent spasms as vomiting, subconjunctival hæmorrhages, lack of sleep, and emaciation. In many cases the relief was so marked that the parents came begging for more of the drug. Many of the patients who responded favourably to the drug had been treated unsuccessfully with bromides, antipyrin, quinine, belladonna, paregoric, and even heroin. In some cases, including three of Dr. Macht's own children, the benzyl was alternated with other treatment, none of which, excepting heroin in toxic doses, proved in the least effective. On the other hand, the benzyl benzoate with benzaldehyde gave remarkable relief both to violence and the number of the paroxysms. There was no evidence that the treatment influenced the duration of the disease. Dr. Macht then investigated the question, How does benzyl benzoate act in whooping-cough. In the first place, the anti-spasmodic effect on bronchial spasm probably plays some rôle. Secondly, he conducted experiments in regard to the action on striated muscle and found a sedative effect, but less than on smooth muscle. Thirdly—a fact of great importance—he observed a slight anæsthetic effect on the larynx. He also found that the anæsthetic action which he had shown to be marked for benzyl alcohol is exhibited in high degree by benzaldehyde, and to a lesser degree by benzyl benzoate, and that both the latter when taken by mouth are excreted in the saliva and bronchial excretions. They therefore probably diminish the sensitiveness of the irritable mucosa of the larynx, and so prevent the reflex which starts the spasms. Fourthly, he found that the benzyl esters are expectorants, and therefore probably help to liquefy the tenacious mucus which is found in the larynx in whooping-cough. Fifthly, he found that benzyl benzoate is sedative to the respiratory centre. Lastly, it was possible that the antiseptic properties of benzyl esters might play a rôle. The low toxicity of benzyl benzoate is important, and would allow administration in larger doses than those recommended.

THE LIPOID GLAND.

IT has been recognised for some time that there are two varieties of adipose tissue: the familiar subcutaneous form, and another in which the fat occurs as small discrete droplets in cells grouped together in well-defined masses. Histogenetically these types of adipose tissue appear to be distinct, and observations on the hibernating glands of such animals as the hedgehog, and the interscapular glands in cretins, both consisting of this glandular fat, show that physiologically they are also different. In a valuable contribution to the current number of the *British Journal of Experimental Pathology* Dr. W. Cramer carries the matter a step further. He points out that in the embryos of all the mammalian species that have been studied a form of adipose tissue exists in which the cells, arranged in lobules, are rich in protoplasm and contain droplets of fat around a central nucleus. In most adult animals this tissue loses its distinctive appearance and is seldom recognisable macroscopically. In the rat and the mouse, however, the embryonic form persists throughout adult life, and can be distinguished very easily as sharply defined, reddish-brown masses. Typical glandular fat differs from ordinary adipose tissue in that its cells are rich in lipoids and contain a relatively large amount of protoplasm. But these differences are relative rather than specific, for the ordinary isotropic fat contains a varying proportion of anisotropic lipoids, while the glandular tissue may contain much true fat, with an apparent consequent loss of protoplasm. The essential difference, however, is brought out in fasting or overfed animals. When food is withheld from a rat or mouse the ordinary adipose tissue becomes greatly diminished in amount, but the glandular fat shows no obvious decrease. Conversely, in states of obesity the glandular fat shows hardly any increase. Still more striking are the results obtained by feeding animals on a diet free from all vitamines. In these circumstances the animals become extremely emaciated, and the glandular fat loses its lipoid contents. But it still remains as a tissue; its cells are large, rich in protoplasm and mitochondria, and are surrounded by capillary blood-vessels: it has, in fact, the characters

which one associates with an organ of internal secretion. Dr. Cramer brings forward a certain amount of evidence to show that glandular fat is functionally related to the thyroid and adrenal glands, and that it contains a reserve supply of a vitamine which can be drawn upon when this substance is absent from the diet. He suggests that this tissue should be known as the lipoid or cholesterin gland. The subject is obviously one of great interest, and offers a fruitful field for inquiry.

AN ARTIFICE IN ABDOMINAL PALPATION.

PALPATION of the abdomen remains in many instances a crux for the present-day clinician. The numerous artifices suggested to render it more easy and overcome the contractions of the abdominal muscles and distension of the walls, besides trying our patience to the utmost, frequently fail us. But palpation is always the most valuable method of exploring the abdomen and the starting-point of all secondary and subsidiary investigations. Professor M. Ascoli,[1] of the University of Catania, has devised a simple method which he has found very helpful and which is, perhaps, not sufficiently well known. The manœuvre consists in this: to ask the patient, who is lying in a supine position with the head and shoulders slightly raised, to take hold of both ankles with his hands and forcibly drag them up, keeping the legs flexed on the thighs and the thighs wide apart and more or less completely flexed on the abdomen. By this means, owing to the discomfort of the patient's position, the consequent distraction of his attention and the force exercised by other groups of muscles, which can be increased by directing him to squeeze his heels, a complete relaxation of the abdominal musculature and flaccidity of the walls can be easily obtained. It must be understood that this artifice is neither universal nor infallible any more than any other, but it certainly deserves trial. In this position the examination is made by introducing one forearm between the patient's legs, while the other takes a lateral position, and when concentrating the palpation on any particular part the patient is asked to increase for a moment the flexion of the thighs. Nearly all methods of palpation can be applied in this position, including that of Hausmann. The method is simple and inoffensive to the patient when the pubic region is covered with a towel.

THE AIR WE BREATHE.

THERE is a wealth of material in the second report just issued on "The Science of Ventilation and Open Air Treatment"[2] by the Medical Research Council from the pen of Leonard Hill, M.B., F.R.S., the director of the department of Applied Physiology to the Council. We dealt with Dr. Hill's first report in THE LANCET of Sept. 20th, 1919. A comprehensive and up-to-date treatment of the subject is again presented which will be read with profit by all those who have the question of healthy environment at heart. We begin to see from this report how antiquated were our ideas, amongst other things, of ventilation, artificial heating and lighting, and Dr. Hill's demonstration of the value of air in movement must bring conviction to the minds of sensible folk. The chemistry of the air is one thing, the physics of the air is another. Carbonic acid is a bogey, humidity and temperature are vital factors. The old rule laid down by Pettenkofer in 1860 and taught by sanitarians for 60 years, that the percentage of CO_2 is a rough indicator of the purity (or adaptability for respiratory purposes) of the atmosphere must go. Water (or humidity), with stagnation, is a greater poison than CO_2, simply by checking the function of that great organ, the skin. Apart from respiratory demands the environment should be such that the skin has freedom of action and a stimulus given to it by a constant flow of fresh air. This fact reminds us of the work of experimental diffusion in the physiological laboratory. As is well-known, the best and most complete results of carrying away the diffusible substance are obtained by keeping up a constant stream of water on the external side of the membrane. So with the respiratory and skin functions. Dr. Hill brings out these points vividly at the same time as he deals exhaustively with the subject in general. He commences with a dissertation on the phenomena of radiation, which is succeeded by a consideration of the penetration and action of light on living organisms. He next deals with the colour of the skin and racial adaptation to climate, passing on naturally to the emission, absorption, and reflection of light by white and black skin. Later he discusses in very interesting sections the influence of sunlight on the transpiration of wet black and white surfaces, with its practical bearing on the question of correct clothing. Heatstroke, food, and exercise conclude the first section. In Section II. we come to the chemical purity of the atmosphere in crowded confined places and in mines, the smoke nuisance, dust, heat stagnation and fitness, health and environment, the physics of clothing, fever, open-air treatment, and methods of ventilation and heating. The whole is a practical study of the common obstacles to the practice of health and the simple way out. It is scientific common sense all the way.

THE FIRST REPORT OF THE MINISTRY OF HEALTH.

THE Ministry of Health Act received Royal assent on June 3rd, 1919, its principal object being to concentrate the main health services of the country in a single department under a Minister of Health responsible to Parliament. Dr. Addison, the first Minister, has just issued the first instalment[1] of his first annual report, dealing in three sections with public health, local administration, and local taxation. The first year in such a reshuffling as was involved in the inauguration of a Health Ministry is naturally a period of reconstruction, for, in addition to its initial commitments, which were immense, the Ministry has during the year taken over from the Board of Education the medical inspection and treatment of school children, from the Home Office its powers under the Anatomy Acts, and other powers and duties in relation to lunacy and mental deficiency. Sanguine people may feel some disappointment that the promised outline of a comprehensive policy for the extension and development of health services has not yet been submitted to Parliament, and that the fate of the Poor-law still hangs in the balance. Dr. Addison explains in his prefatory note how the magnitude and complexity of the issues involved have combined with the heavy Parliamentary pressure in preventing the presentation of this policy as a whole. The broader work of the Ministry of Health still remains to be done. The present report is a chronicle of such developments and extensions of health work as could properly be set on foot without fresh legislation; important indeed, but of less burning interest than what is to come. The Minister of Health records his appreciation of the cordial coöperation in many spheres of action which he has received from authorities locally responsible throughout the country. It is on the continuance and further development of this coöperation that the success of the larger measures will chiefly depend. The coming year will doubtless be the arena of a bold attack on the larger issues. The annual report for 1919–1920 of the chief medical officer of the Ministry is announced to appear shortly in a separate volume.

THE Neurological Section of the Royal Society of Medicine has invited Dr. Henry Head, F.R.S., to deliver the Hughlings Jackson lecture, and it will be given at 1, Wimpole-street, London, W., on Oct. 7th, at 8.45 P.M. The subject of the lecture will be "A New Conception of Aphasia."

[1] La Riforma Medica, July 17th, 1920.
[2] The Science of Ventilation and Open-Air Treatment, Part II. Special Report Series, No. 52, published by His Majesty's Stationery Office.

[1] Cmd. 923, H.M. Stat. Office. Price 1s. 6d.

PUBLIC HEALTH IN SOVIET RUSSIA.

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III.—ASTRAKHAN AS A CENTRE OF INFECTION.

THE unfortunate illness of a member of the delegation made it necessary for him to remain on board the s.s. *Bielinski* when we arrived at Saratoff, and as I could not leave him my journey on the Volga was extended right down to Astrakhan. Two other members of the party—Mrs. Snowden, a member of the delegation, and Mr. Bertrand Russell, who came with us—remained on the steamer with me to nurse the patient. During this voyage we lived with Mr. B. M. Sverdlov and his staff, and without the official receptions, speeches, and parades which had been our lot up to that time.

Lack of Antimalarial Measures.

On approaching Astrakhan I was struck by the complete absence of all measures to prevent malarial infection. The fact that I insisted on fitting up the invalid's cabin windows with mosquito muslin was evidently a revolutionary proposal—copied, by the way, by all the staff who could obtain the very scarce material. Conversation on this subject led Mr. Sverdlov to ask me to undertake an inspection of Astrakhan and report to him on the hygienic measures necessary to prevent malaria and improve health conditions generally. I accepted this suggestion after some demur (on the ground of poaching on the Russian doctors' preserves) for two reasons: (1) the wish to assist in any way I could with suggestions for improving the demonstrably lamentable conditions, and (2) the desire to see for myself the actual conditions from the medical inspector's rather than the medical tourist's point of view. On arriving at Astrakhan I had a conference with the chief medical officer of the town, Dr. Mishkin, and his assistants, Drs. Sandler and Saccal, and got from them a great deal of general and also of precise information in answer to a questionnaire which I had previously drawn up. On June 6th I made an inspection of the town in general, including the surroundings, the two large rubbish deposit areas, and the hospitals. On June 7th I inspected the waterworks and some other parts of the town. I was informed that Astrakhan had only recently come under civilian control, having been up to about three weeks previously in the hands of the Red Navy, who, I was told, had done pretty well what they thought fit.

General Sanitary Condition of the Town.

The town contains about 200,000 inhabitants, and is built on the delta of the Volga on marshes, and surrounded by marshes. Ferry steamers—which were busy and crowded—are necessary to connect parts of the town which are separated by arms of the river. At the time of our visit the temperature was over 120° Fahrenheit in the shade, and the place extremely oppressive. The streets themselves are very dirty. No water carriage system for sewage exists, and the sanitary service of refuse-collecting carts for the conveyance of rubbish and fæces to the dumping grounds outside the town has been suspended for over a year. In many streets there were long continuous heaps of refuse and fæces, about 2 ft. high, dried into a compact mass all the way down the middle of the roadway. Very many houses had been partly destroyed by severe aeroplane bombing, and in one street practically every house was gutted, the outer walls alone standing. The dump-grounds for refuse had been untouched for about a year and were deserts of drifting dust. The waterworks was in such a state of disrepair that the pumping-engines spouted water from the joints of the machinery at each stroke, and the large iron store-tanks had to be plugged with match-like bits of wood wherever the water pressure broke through their thin crust, and the sand filter was simply not working. The sand filter also leaked into the road—a very broad although squalid avenue—in front of the works, and formed a little lake about an acre in extent. Nevertheless, the water-supply to the town is still maintained, and the engineer in charge (a man with the typical appearance of chronic malaria) was of opinion that the water in the pipes was purer than that in the Volga. It was less discoloured, but the filter was quite useless against bacteria. Another defect of the waterworks is that its intake was in the region of the Astrakhan docks in the Volga, about 50 yards from the bank, and, on the day of my visit, immediately behind the stern of a steamer apparently engaged in trade with Baku in the Caspian.

Mosquito-breeding Grounds.

Not only are the streets dirty, but pools of water are common everywhere—at the roadside, in the gutters, on bits of waste land where holes have been excavated, in the middle of the road, and, in fact, everywhere where a depression in the ground exists. One of the first things to attract my attention on leaving the boat and walking out of the dock gates was a little stagnantly moving gutter stream covered with a green water weed into which a large bright-eyed frog plopped on my approach. This little gutter stream meandered out from under a wooden paling higher up the road and no doubt went on to the Volga. In many of the near by streets there were large pools in the road. The basements of the gutted houses previously referred to were flooded with water. Round the town are wide expanses of shallow water covered with picturesque whispering reeds—6 to 10 feet high—with little creeks creeping up to the house walls and winding into the town itself. On going into the matter in detail with Dr. Mishkin and his assistants I found that seven-tenths of the area of the town is water surface. When I asked what was being done about the flooded basements, the pools in the streets, the gutters, and the accumulation of water on waste land in the town, I was told that it would dry up later on in the year. Meanwhile nothing was done. When I inquired what was being done about the picturesque lagoons of reed-shaded waters creeping right up to the town I was told they were too extensive to tackle. It was a case of "Nitchevo" (Never mind)—a universally employed Russian expression embodying the spirit of that passive non-resistant acceptance of adverse conditions of hardship and evil which is characteristic of Russian people.

Universality of Malaria.

Under these conditions I was not surprised to learn that malaria is universal and distributed over all sections of the population. Fishermen, who live in extremely picturesque wooden shanties on the edge of the river or on islands only an inch or two raised above its surface, suffer most. The population on a little hill—or rather mound—in the centre of the town on which the local fortress (Kremlin) is built suffer least. The outskirts of the town are more affected than the centre. When I pressed the importance of these facts and asked why at least drainage of pools and stagnant water in the town itself was not carried out, I was told that it had been discussed, but that there was a lack of labour and materials. Both of these statements were true in general, but nevertheless it was possible to get labourers from Persia for the docks (Mr. Sverdlov arranged this while we were in Astrakhan), and a good deal might have been done with no more implements than a few shovels and picks.

When I suggested that there was an unlimited supply of oil available at Baku (connected by railway and steamer lines) for spreading over pools, I was told that this was not done for fear of killing breeding fish and injuring the fish industry and caviare industry of Astrakhan. But however valid this reason might have been for certain water areas, it did not apply to the mosquito-breeding grounds immediately round and in the town, which were mere stagnant pools or waste expanses of water. The treatment of malaria in Astrakhan was no more satisfactory than the prevention. There was no attempt at the isolation of cases, no material for isolation, and a practically complete absence of quinine. I did not have time to examine individual cases at Astrakhan, but I did so at Saratoff, where I saw two malaria cases untreated with quinine

with spleens extending to below the umbilicus, a condition I was assured was common. Most of the cases of malaria in Astrakhan are said to be benign, but there had been ten malignant cases lately with sudden coma as first sign of illness. The mortality from malaria was stated to be about 20 per cent., "probably more." Eight-tenths of all cases of illness in the town were malaria. The last year for which statistics are available is 1914, when 16,180 cases of malaria were registered out of a population of 140,800. The largest monthly number of cases were registered in August and December. Men were most affected between 20 and 40, women between 15 and 30.

Suggested Measures for Sanitary Organisation.

The public health organisation for dealing with these conditions was not adequate. The town was divided into six districts, and for each of these areas a sanitary medical officer was appointed. But each "sanitary medical officer" held three, four, or more other appointments of a clinical kind and had, in consequence, very little time to devote to his duties. Also, each sanitary officer had only two men to assist him in each district, who were paid and rationed on a low scale, and no transport of any kind.

As I was asked for suggestions I made those obvious ones connected with drainage, treatment by oil and removal of rubbish, familiar to all with any experience of antimalarial work, and, in addition, suggested that the "sanitary medical officers" should be relieved of all

FIG. 1.—Map issued by the Soviet Commissariat of Health for educational purposes to show the principal routes of the spread of cholera from India.

other work but paid the salary for all appointments relinquished; and, further, that the sanitary personnel should be largely increased (to 24 for each district), supplied with transport, and paid and rationed on the Red Army scale, and selected from those having knowledge of sanitary matters, or, failing these, from people of education who would appreciate the importance of sanitary work. I also suggested that a small fee should be paid for notification of infectious disease by doctors, sanitary service men, or representatives of the trade-unions. Other detailed suggestions were made regarding general cleanliness and for dealing with and preventing cholera and plague. Mr. Sverdlov travels with an advisory medical officer on his staff of experts, and this officer (a woman, Dr. Dmitrieff) entirely concurred in my suggestions.

The Town as a Danger Centre.

The existence of Astrakhan as a centre of malarial infection is serious enough (I was glad to get all my own party away without any of them falling ill), but when it is realised that it is one of the chief places from which cholera and plague spread it is difficult to exaggerate its importance. Last year there were 600 cases of cholera in Astrakhan and a very limited traffic on the Caspian Sea and on the Volga. This year a great many cases are expected, and there is much traffic on the Caspian Sea and the Volga, while the condition of the waterworks can only be described as admirably arranged to spread an epidemic. From Astrakhan the cholera will spread up the Volga and through Russia. The map (Fig. 1), issued by the Commissariat of Health for educational purposes, shows the probable routes of infection. How near it will come to Western Europe remains to be seen. I was told that cholera comes to Astrakhan from up the Volga, that it increases in virulence in Astrakhan, and then spreads up the river again. The kind of poster propaganda undertaken by the Russian Government is shown in the illustration (Fig. 2), but is reinforced in the original by a picture below the one reproduced showing a cholera patient receiving intravenous injections in hospital. There was no plague in Astrakhan or on the Steppe to the East at the time of my visit, but

DESCRIPTION OF PROPAGANDA POSTER.

The illustration given on the opposite page is part of a Soviet propaganda poster showing the path of infection in cholera by means of water and flies. In the original poster a panel below portrayed a cholera patient in extremis being treated by saline injection. A microscope and a microscopic field of cholera germs were also pictured. The Russian text printed on the poster is as follows:—

PROLETARIAT OF ALL COUNTRIES, UNITE!

Cholera is a contagious disease, attacking principally those who live in dirty, poor, and overcrowded districts.

The great scientist, Robert Koch, discovered that cholera is caused by certain microbes.

These microbes are the smallest living atoms, which can be seen only by the help of a microscope, and are called cholera germs.

The symptoms of a light attack of cholera are diarrhœa, and sometimes sickness.

The symptoms of a severe attack are diarrhœa, sickness, great loss of flesh, coldness and blueness of the whole body, stopping of the urine, and cramp.

On the second or third day, and sometimes in a few hours, it can end in death.

Those who recover carry the germs for some time and may infect others.

Flies often carry the germs of cholera from the motions of the sick to food and objects of domestic use.

Especially dangerous is the infection by cholera germs of the water-supply, causing widespread epidemics among the population using the springs.

The cholera germs cause infection only when the microbe enters the intestines either by way of the mouth in food or drink, or by dirty hands. Milk, vegetables, fruit and other products bought at the markets or from hawkers may be infected by cholera.

Together with the motions containing the cholera germs, the contagion infects the soil, clothes, domestic utensils, food and drinking water and through them is carried to other people.

Uncovered water-supplies cannot be effectively protected from dirt, consequently this water can be used only after having been filtered or boiled.

In cases of cholera infection, hurry at once to the hospital, only there can you receive the necessary help. The placing of the sick in hospital removes the danger of spreading the disease among relatives and neighbours.

if it comes there is nothing to prevent its spread. Amœbic dysentery is also very serious in the town and neighbourhood, and there had been 100 cases of operation for hepatic abscess during the last 12 months.

Typhus and relapsing fever had devastated Astrakhan last winter as every other place in Russia, and I was told a story of the marching out of a Cossack army toward the Caucasus and the finding of some thousands of unburied bodies on the ground a day or two's march from the town, where an epidemic had stricken the army down. No really reliable statistics over a long period were available since 1914, but I give here the number of cases of actual illness of certain kinds on June 7th as stated to me by the chief medical officer, and which do not include malaria or dysentery.

Cases of Infectious and other Serious Illness at Astrakhan in Hospital on June 7th, 1920.

Scurvy	642 cases.	Typhoid fever ...	14 cases.
Relapsing fever ...	306 ,,	Small-pox	6 ,,
Typhus fever ...	196 ,,	Indefinite fevers ...	29 ,,

There were stated to be "casual cases" of diphtheria and "quite a number of deaths" from measles. Vaccination (in contradiction to what I was told at the

FIG. 2.—A SOVIET PROPAGANDA POSTER. *(Description on opposite page.)*

FIG 3.—Part of a Soviet propaganda poster showing effects of small-pox with recommendation to seek vaccination. On the original poster is a group of children and adults being vaccinated. The Russian text runs substantially thus: "Many die from small-pox, many become blind, and those who recover remain pock-marked. To protect yourselves from small-pox is easy; you must be vaccinated several times during your life. The fulfilment of the law of vaccination is the duty of every citizen of the Republic. Vaccinate yourselves against small-pox, and repeat the vaccination not less than every five years."

Commissariat of Health in Moscow) was said not to be compulsory; it was also said that there was a lack of vaccine and that the practice of vaccination had slackened during the revolution. Propaganda in favour of vaccination is also being done by poster, the upper part of one, showing effects of small-pox, being reproduced here (Fig. 3), while underneath (not reproduced) is a picture of a doctor and nurse vaccinating children brought by their parents.

Hospital accommodation was both insufficient and bad. Immediately outside the window of one of the main wards of the hospital was the edge of an oozing mud of fæces from the hospital cesspool, which covered a large area of the garden. I was told nothing could be done for the familiar reasons. It was another case of "Nitchevo." The ward was full of flies, which, of course, swarm everywhere. The general arrangements of the hospital were not good, it was dirty and untidy, and there was an almost complete absence of drugs and dressings, including chloroform and ether.

A certain amount of soap is made locally from seal-fat and fish-fat. It is a repulsive compound with a strong and nasty smell. Some of it was on sale in the market, dark brown in colour and looking like a greasy half-brick.

A Sanitary Commission Needed.

The state of affairs revealed in Astrakhan is dangerous, not only to that town and the Volga basin, but to the whole of Russia, and through Russia to Western Europe. Astrakhan is the chief port of the Caspian Sea and is connected by important trade routes with Persia and the Near East through Enzeli and with Turkestan and the further East through Krasnovodsk. Through Astrakhan flows the great river traffic up the Volga with direct river connexions reaching to Petrograd and Moscow. Both by railway and sea Astrakhan is also connected with Baku and Petrovsk. It is thus of the greatest importance that Astrakhan should be put into a sanitary condition at the earliest possible moment. At present the town is a fortress or headquarters of disease from which it may sally at any moment to invade the rest of the world. I have reason to believe that the Soviet Government would consider the question of receiving a foreign sanitary commission to put matters into good order, and among the first tasks of such a commission would be: (1) extensive anti-malarial measures; (2) provision of special hospital accommodation for malaria and other infections; (3) general de-lousing and disinfection campaign; (4) repair and improvement of waterworks; (5) general cleanliness campaign; (6) provision of system of medical inspection of steamers arriving and departing and of travellers arriving by boat, by train, or otherwise.

Similar Conditions Rule Elsewhere.

I have dealt with Astrakhan in some detail because it is the town I have most detailed information about in Russia and because of its own individual importance, also because I believe it to be typical of the conditions now existing in many provincial towns in Russia. Streets are very commonly extremely dirty—the streets of Samara were as dirty as those of Astrakhan, although those of Saratoff were much cleaner; general housing conditions in the villages are described as very bad by the Commissar of Public Health. Vermin infection is excessively common. Statistics supplied me at Saratoff show that parasitic infections increased by 1500 per cent. between the middle of 1918 and the middle of 1919. The morale of the medical personnel has suffered seriously in the long war and revolution, and some have given up hope of change for the better. Also nearly all doctors are overworked. In many places there are no doctors at all. In the whole Astrakhan province outside the town I was told that there was only one doctor. And there is an almost complete lack of medicines, dressings, disinfectants, and soap. Despite the great and heroic efforts of the Commissariat of Health the organisation of civilisation is literally, as at Astrakhan, crumbling to pieces. It seems to me a condition in which the medical profession of this country might well offer the services of a non-political mission of help and health to our Russian colleagues, who are tried so much beyond their strength. The financial and political arrangements could perhaps be made directly by the Governments concerned.

(To be concluded.)

CLINICAL TEACHING AT LONDON SCHOOLS OF MEDICINE:

THE PROFESSORIAL UNITS.

As stated in the leading article of our Students' Guide, published on August 28th, a representative of THE LANCET recently visited the five medical schools which have adopted the clinical unit system to ascertain the structure and proposed functions of the professorial units. In all cases the innovation is so recent that the arrangements are to be regarded as tentative and experimental. Nevertheless, it is clear that there are distinct divergencies of practice which are of importance only in so far as they depend on differences of principle and not on local conditions. It will be instructive to watch the future development of the clinical units in the five schools, as it is impossible to determine at present whether the differences are fundamental and likely to increase or whether they will tend to disappear. We have not attempted to indicate the arrangements for research, which are in most cases still incomplete, but it may be reiterated that the whole conception of the unit system depends on the choice of a clinical teacher from among those who are actively engaged in medical investigation and research.

St. Bartholomew's Hospital Medical School.

The unit staff of St. Bartholomew's Hospital Medical School is as follows:—

Medical.—Director; Vacant (full time). Assistant Director: Dr. F. R. Fraser (half time). Assistants: (1) Dr. A. E. Gow; (2) Dr. G. Graham (three-quarter time). Resident House Physician.

Surgical.—Director: Mr. G. E. Gask (full time). Assistant Director: Mr. T. P. Dunhill (half time). Assistants: (1) Mr. R. Ogier Ward; (2) Mr. G. L. Keynes (three-quarter time). Resident House Surgeon.

The professorial clinical unit, as it is called at St. Bartholomew's Hospital, consists of surgical and medical firms, differing from the non-professorial firms mainly as follows:—

1. Since the directors are continuously in hospital the routine superintendence of patients is done in the mornings or at any odd times, so that the official "round" can be devoted to the demonstration of cases interesting to the students.

2. The units have their own laboratories, all on the same floor, where full pathological investigations, including morbid histology, Wassermann and Widal tests, chemical pathology and bacteriology are performed by the unit staff, who also do their own post mortems. In cases of difficulty reference can be made to the appropriate department of the pathological institute.

Clinical work.—As to the order in which clinical appointments are held, great latitude is allowed to students at St. Bart.'s. A typical student, after passing intermediate, does six months' consecutive in-patient dressing. He may dress for any one of five surgical firms, of which the unit forms one, and this post includes dressing in casualty, though not in the out-patient department. At St. Bart's the casualty department is under the supervision of members of the honorary staff, and deals with a large number of cases which in many other hospitals would be treated as surgical out-patients. Certain cases, perhaps six or eight, of special interest for teaching purposes are selected and these only are referred to the out-patient department, where old in-patients, followed up on a card index system, are also seen. The director and assistant director each spend one morning in casualty and teaching in the out-patient department. There they are attended by senior out-patient dressers and not by the dressers to the unit firm. The beds allocated to the unit are shared by the directors. This arrangement is peculiar to the professorial unit since the members of the senior staff at St. Bart.'s do not see out-patients. In order to ensure a complete investigation and discussion on all cases the bacteriologist to the hospital accompanies the director on his rounds from time to time, while the lecturer on morbid histology pays regular visits to the unit laboratories and demonstrates on the microscopical sections of the cases. After six months in the surgical wards a student acts as clerk to the in-patients to a medical firm other than the professorial unit for three months, and then proceeds to the out-patient departments, to courses on fevers, pathology, and so forth. He then returns to the wards for a second three months' clerking, and it is these senior students who, as far as vacancies allow, become clerks to the medical unit. The medical clerk attends out- as well as in-patients with the unit staff. Private rounds are done in the morning while the student works up his cases; the afternoons are spent in formal teaching in the wards. In the past session Sir Archibald Garrod, the late director, devoted one afternoon to post-graduate teaching, from which the undergraduates were, however, not excluded.

Pathology.—Though, as has been emphasised, the unit undertakes its own pathology, the dressers and clerks are not expected to perform the actual investigations except the minor ones. The senior students learn post-mortem and other pathological technique in the pathological institute when attached as pathological clerks to members of the visiting staff.

Remarks.—In the future it is hoped that the unit, besides working as a firm, will organise combined demonstrations in medicine, surgery, and pathology on individual cases, to be attended by all students during their first period of clinical work. Detailed technique, such as splint application or the use of instruments of diagnosis, will probably not be taught in these demonstrations, where an attempt will be made to focus the attention of the student on the fundamental unity of all processes of disease, and on the close connexion between medicine, surgery, and pathology.

London Hospital Medical School.

The unit staff of London Hospital Medical School is as follows:—

Medical.—Director: Dr. C. H. Miller. Assistant Director: Dr. A. W. M. Ellis. Assistants: (1) Dr. G. Riddock; (2) Dr. Maitland-Jones. Resident House Physician. Assistant House Physician.

Surgical.—Director: Mr. H. S. Souttar. Assistant Director: Mr. E. C. Lindsay. Assistants: (1) Mr. W. S. Perrin; (2) Mr. G. E. Neligan. Resident House Surgeon.

The teaching activities of the London Hospital clinical units are centred in:—

1. A concentrated course of clinical medicine and surgery, one month each, through which every junior student must pass.

2. The organisation of special series of lectures, open to senior students and post-graduates, by experts, not necessarily members of the units, on their special subjects.

Clinical work.—The London Hospital student, having passed intermediate, spends the next three months as a pathological clerk, learning practical morbid anatomy and clinical pathology before entering the wards. Then the units take him over. He does a concentrated course of one month with each unit, comprising, on the surgical side, the elements of case-taking and of theatre work and dressing. He learns the technique of clinical examination; demonstrations of typical cases in the wards are given, also demonstrations in splint application and plaster work, and the students attend at operations. During this month the student has no duties outside those of the unit, and his time is fully occupied in getting a sound foundation before entering the wards as a dresser. On the medical side a month is taken up with learning the elementary principles of physiology as applied to medicine and the methods of clinical examination and of treatment. Demonstrations are held in the wards, out-patient departments, and children's departments. Besides these courses, which are taken by all students, a certain number—as many as possible of those who apply—do three months' dressing and clerking with the unit as a firm. This appointment differs from an ordinary post as clerk or dresser only in so far as the chief is on the spot all day to supervise, direct, and encourage the student. When possible the student does the second of his two three-months' post in the unit firm in medicine and in surgery. The units undertake neither systematic lectures nor revision courses at present. The former are given by the lecturers in medicine and surgery, and the tutorial classes by the appropriate tutor. The units at present confine themselves to the teaching of junior students, to organising series of special advertised lectures held for fourth and fifth year students and open to post-graduates, and to clinical teaching in the wards and out-patient department.

Pathology.—The students on the unit firm perform blood counts and investigations of sputums, urines, and so forth, but for their own edification only; all investigations are done also in the pathological department of the hospital. Ward laboratories are to be built in the future, where students may be required to do more work under supervision.

Remarks.—The system of note-taking in triplicate devised by Mr. A. J. Walton has been adopted by the units. The notes of the director and his assistant are kept separately, and belong to the unit. The notes of the house physician are filed with the hospital records, while the students' corrected notes alone are on the bed boards. These may be removed and kept by the student for future references.

St. Mary's Hospital Medical School.

The unit staff of St. Mary's Hospital Medical School is as follows:—

Medical.—Director: Dr. Wilfred Harris (half time at present). Assistant Director: Dr. C. M. Wilson (10–4, five days a week). Resident House Physician.

Surgical.—Director: Mr. W. H. Clayton-Greene (half time at present). Assistant Director: Mr. C. A. Pannett (10–4, five days a week). Resident House Surgeon.

At this school the chief changes coincident with the establishment of the clinical units are:—

1. The rearrangement of the time-table in order to leave free the hour 12–1 for all hospital students to attend demonstrations given on alternate days by the medical and surgical units. Cases are allocated to senior students, who are encouraged to consult the literature and to demonstrate and discuss not only the individual case but the ætiology and the pathology of the disease.

2. In order to ensure to students a thorough experience in diseases of children and in chronic cases arrangements have been made for amalgamation for teaching purposes with the Paddington Green Children's Hospital, the Maida Vale Hospital for Nervous Diseases, and the Paddington Infirmary. The teaching at the children's hospital is to come into operation next session; last session demonstrations were given from time to time at Maida Vale, and one afternoon in each week was allocated by each unit to a round at the infirmary with senior students. On one afternoon round, at which a representative of THE LANCET happened to be present, the cases demonstrated included senile gangrene of the toes, Pott's disease with spastic paraplegia, cellulitis following varicose ulcer, and advanced inoperable carcinoma of the intestine—none of these being cases ordinarily met with by students.

Clinical work.—The student at St. Mary's passes from his intermediate studies to the casualty department for two months, during which time he also passes through courses of elementary surgery and medicine and elementary clinical pathology. He then does three months' surgical in-patient dressing, followed by three months' in-patient medical clerking, in each case with the unit or one of the two other firms. After three months in the out-patient department he returns to the wards. The second three months in-patient clerking and dressing are usually done in the second hospital year.

At St. Mary's no definite courses of lectures are arranged by the unit, and neither the systematic lectures nor the junior clinical courses and demonstrations are given under its auspices. The units attempt to use the enormous quantity of material at the disposal of the teaching staff since the amalgamations and to train all the students to extract the utmost scientific information from their clinical work. The daily demonstrations are attended by all the students, and the ward and theatre demonstrations by the students on the post and by senior students. A feature of the ward teaching is the limitation of the numbers attending demonstrations, which entails their frequent repetition.

Pathology.—The pathology of the unit is done in the appropriate departments of the pathological institute, where senior students work under the supervision of the staff of the departments, who are responsible for its accuracy. On one afternoon in every week naked-eye specimens and microscopic sections are sent to the unit laboratory, where they are demonstrated by the surgical director with the clinical notes. The pathological technique is learnt by the student in due course when he does his pathological clerkship, and it is considered that no advantage would be gained by the medical clerk and surgical dresser if he were expected to do more than routine pathological investigations as well as his other duties.

St. Thomas's Hospital Medical School.

The unit staff of St. Thomas's Hospital Medical School is as follows:—

Medical.—Not yet formed.

Surgical.—Director: Sir Cuthbert Wallace (part time). Deputy Director: Mr. B. C. Maybury (part time). First Assistant: Mr. W. W. Wagstaffe (whole time). Pathological Assistant: Dr. S. C. Dyke (whole time). Resident House Surgeon.

The work of teaching is divided between the surgical staff and that of the unit; there has been no attempt on the part of the unit to take over or direct all the teaching. Owing to the composite nature of the student's education and the growth of special departments it is considered that the correlation of teaching must be the function of the dean and the body that governs the school and not of the unit.

The lectures that are now given in the medical school are modelled on the system which was instituted just before the end of the war. Instead of having lectures on medical medicine and surgery, a subject is taken and lectures on it are given by the members of the staff and of the unit who are best acquainted with the subject, and by the other departments, such as those of anatomy, physiology, radiology, &c., when these can help.

It is felt at St. Thomas's that it is especially necessary to avoid the unit's becoming an isolated realm within the school.

Clinical work.—The student at St. Thomas's after he has passed intermediate, and before he takes up his work in the hospital proper, passes through a course in elementary medicine, surgery, clinical pathology, bacteriology, and pharmacology which is intended to fit the student to benefit by the teaching in the wards. The teaching is shared by the departments concerned and the unit. It is an open point whether all or only a certain number should work under the unit as a firm. At present it is felt that a short period in the unit is of little use, and dressers are taken on for six months.

The actual teaching undertaken by the unit at present is as follows: (1) A teaching round for senior students. (2) Two rounds for junior students, one of which takes the form, frequently, of a clinical lecture demonstration. (3) An out-patient afternoon, in which out-patients and old ward-cases are seen. (4) The deputy director and the first assistant take one morning each in the sorting-room, where senior students are admitted to watch the practice of the hospital. (5) The deputy director takes a class once a week in surgical anatomy. In this class the dissected specimen and the live model are used side by side. This class keeps the unit in touch with the anatomical department. (6) The pathological assistant gives classes in physiology and pathology, and it is hoped that he may also be a link between the unit and the physiological department.

Pathology.—The pathological investigations which are required for each case the student conducts himself under the direction of the pathological assistant. The latter will have the benefit of the advice of the professor of pathology, thereby forming a link between the unit and the pathological department proper.

The unit laboratory accommodation is spacious, and consists of (1) a small laboratory for the pathological assistant; (2) a large laboratory where each student will have his own place; (3) a small departmental library or meeting-room; (4) an office.

University College Hospital Medical School.

The unit staff of University College Hospital Medical School is composed entirely of full-time officers as follows:—

Medical.—Director: Dr. T. R. Elliott. Deputy Director: Dr. J. W. McNee. Assistant in Neurology: Dr. F. M. R. Walshe. Resident House Physician.

Surgical.—Director: Mr. C. C. Choyce. Assistants: (1) Mr. E. K. Martin; (2) Mr. F. J. F. Barrington; (3) Pathologico-surgical Registrar, not yet appointed.

The important alterations which accompanied the establishment of clinical units at University College Hospital are as follows:—

1. The units assume entire responsibility for the whole of the systematic teaching, respectively, in medicine and surgery. This does not imply that the teaching is now confined to the personnel of the units, but that they have undertaken to organise it, and the lectures given by other members of the staff on subjects in which they are specially eminent or interested are given by invitation of the directors of the unit concerned. The tutorial and revision classes are held by members of the unit; no attempt is made to give revision classes for post-graduates.

2. All physicians and surgeons on the honorary staff now have an equal number of beds and all take out-patients. This arrangement is said to have the treble advantage that the senior and most experienced physicians and surgeons teach in out-patients' department, that students in any firm are enabled to watch a given case from the day of its appearance in the hospital until its discharge from the wards and after, and that the younger members of the staff are not hampered for many years by lack of beds.

3. The gift of £800,000 made this year to the medical school by the Rockefeller Board will enable a Unit in Obstetrics and Gynæcology to be established, also on a full-time basis, as soon as the necessary new buildings are completed. The school will then be equipped with three complete units.

Clinical work.—After passing his intermediate the typical student at the University College Hospital proceeds directly to the wards, where he spends six months as clinical clerk or dresser, four of which are on another firm and two on the unit firm, and six months as surgical

dresser, two of which are similarly on the unit firm. It is fortuitous whether students do medicine or surgery first, but in the opinion of the directors it is more advantageous to do medicine first and also to be attached to the unit firm for the last two months in either subject. In the future it is hoped by the directors that two months' work as clerk or dresser will be postponed to the second clinical year, so that the practical study of general medicine and surgery will be continued up to the end of the student's hospital career.

All students spend two months attached to each unit firm. On the medical side the unit clerks take cases among the tubercle patients under Dr. S. J. Martin, Dr. H. Batty Shaw, and Dr. F. J. Poynton; children and infants under Dr. McNee; heart cases under Dr. T. Lewis, and nerve cases under Dr. Walshe; and their time-table is arranged to include rounds with these members of the staff.

Pathology.—The pathology of the cases under the care of units is at present done in the pathological department, where the senior students hold clerkships and learn technique. The surgical unit proposes shortly to add to its staff a pathologico-surgical registrar, who will work in laboratories to be erected near the wards and will be responsible for the pathology. The sections will be cut and stained by students on the unit firm under his supervision; the pathological department of the hospital will thus not receive the pathological material from the unit firm as a routine, but will act as consultants when required.

On the medical side the unit clerks at present do the sputum and urines, but when laboratories are developed in direct connexion with the wards more pathological work will be done by the clerks and medical staff of the unit. It is considered that the students doing the clinical work must collect more of the pathological evidence themselves in order that they may learn to appreciate its value in diagnosis.

TUBERCULOSIS IN WALES:

THE WORK OF THE WELSH NATIONAL MEMORIAL.

TEN years ago this month the King Edward VII. Welsh National Memorial (Tuberculosis) Association was inaugurated. When the tuberculosis provisions of the National Health Insurance Act, 1911, came into force this Memorial Association, a voluntary institution owing its existence largely to the financial generosity of its president, Major David Davies, received support from various Welsh health authorities, who delegated to it their responsibilities with respect to the treatment of tuberculosis. Steadily through the last decade the Association has been consolidating its position, skilfully guided through some local opposition and many pitfalls by its general director, Mr. D. W. Evans.

The past 12 months has been especially momentous in its history. In the first place its position as a Welsh national institution was fully recognised when their Majesties, accompanied by Princess Mary, opened the North Wales Sanatorium for women and children at Llangwyfan, overlooking the far-famed Vale of Clwyd, and the South Wales Sanatorium for men and boys, placed in scarcely less beautiful surroundings at Talgarth; then it is able to record that the last outstanding health authority in the Principality, Pembrokeshire, has thrown in its lot with the Association, moved thereto by discovering that the expenses involved in a separate tuberculosis scheme would mean a 5*d.* rate as contrasted with the 1*d.* rate asked by the Association; next it can point out that a stern financial battle with the Treasury authorities to obtain full recognition has resulted in its favour; and, finally, it is enabled, owing to private generosity, to announce the foundation of a chair of tuberculosis in the Welsh National School of Medicine, the occupant of which is to be principal medical officer of the Association, so holding a unique position. These four facts are no mean achievements to record as the result of post-war activities.

The work of the Association is carried on by pooling the resources of the Principality; this enables the most up-to-date treatment to be established in economic units, surgical cases being drafted to specialised hospitals, medical cases to others, and sanatorium cases to yet other specialised institutions. Every advantage to the patients and to economic management is in this way obtained. The Association has at its disposal, distributed over some 14 institutions, between 1100 and 1200 beds, a total which is being steadily increased. The medical staff numbers over 20 and is also being rapidly increased. These increases are needed to cope with the flow of work, as may be seen from perusal of the annual report for the year ending March 31st, 1920, which has just been issued with commendable promptitude.[1] The following summary table is of interest in this connexion:—

Patients.	1913–14	1914–15	1915–16	1916–17	1917–18	1918–19
Examined	8,763	8,868	9,155	10,739	11,780	12,260
Received sanatorium treatment	888	1,214	1,290	1,360	1,258	1,251
Received hospital treatment	1,185	1,789	2,178	2,504	2,551	2,380
Received institute treatment	3,722	5,203	4,720	4,690	5,143	4,867
Recommended for domiciliary treatment	1,200	1,634	1,944	2,924	3,317	3,548

The result of sanatorium treatment is summarised in the next table, which wisely is not brought forward further than 1918, since more recent figures in Columns 4, 5, and 6 would obviously be fallacious for comparison with previous years. Indeed, in relation to this table we should like to be informed when the figures for previous years cease to be revised. Some period, say five years, should be fixed, since, for instance, everyone included in Column 2 must with effluxion of time finally appear in Column 6.

Return of Patients who were Discharged from Sanatoriums from the Year 1912 to 1918.

Year.	Number discharged.	Well and at work March 31st, 1920.	Not well.	Left the district and cannot be traced.	Dead.
1912	42	13 (30·95%)	2 (4·77%)	9 (21·42%)	18 (42·86%)
1913	515	210 (40·79%)	35 (6·79%)	78 (15·14%)	192 (37·28%)
1914	790	341 (43·16%)	64 (8·10%)	104 (13·17%)	281 (35·57%)
1915	877	388 (44·24%)	77 (8·78%)	138 (15·73%)	274 (31·25%)
1916	894	440 (49·22%)	74 (8·27%)	115 (12·87%)	265 (29·64%)
1917	862	478 (55·44%)	93 (10·79%)	91 (10·56%)	200 (23·21%)
1918	879	505 (57·45%)	123 (14·0%)	79 (9·0%)	172 (19·55%)

One activity calls for special reference. The renewal of the education campaign under the direction of Dr. R. Owen Morris, which was developing on excellent lines when interfered with by the war. This campaign is built on the sound foundation that treatment will never eradicate tuberculosis, but that "the community must learn the principles and practice of hygienic living and the methods of prevention." This campaign should be more widely extended; 357 lectures in schools and 23 public lectures are insufficient for the Principality.

We note that a colony for training discharged Service men suffering from tuberculosis is being embarked upon in connexion with the Talgarth Sanatorium. Valuable information as to the efficacy of after-care through this form of industrial convalescence should in this way be obtained, which may be expected to result in the Association extending it from ex-Service men to civilians, victims of peace-time conditions. We feel some confidence that ere long no sanatorium will be considered complete without special workshops suited to the special needs of those local industries from which the patients are drawn.

The report further contains the welcome information that a scheme of research work only awaits the appointment of the principal medical officer to be undertaken. We have long felt the coping-stone the Association needed to its structure was closer coördination of medical work directed more particularly towards research, for which the facilities at the disposal of the Association are admirably suited. We look forward to information in the next annual report stating that action has commenced on these lines. From such action valuable results must ensue.

[1] Annual Report for the Year Ending March 31st, 1920, of the King Edward VII. Welsh National Memorial Association. W. Whittington Neath.

MEDICINE AND THE LAW

The Patient's Consent to Operation.

AT a recent inquest at Liverpool upon the body of a woman who had died in the infirmary after an anæsthetic had been administered for the purpose of an operation, relatives of the deceased complained to the coroner that they had not been informed that an operation was to take place, and that the patient had not consented to undergo it. Evidence was, however, given that the patient had been informed that an operation was necessary, and that she had raised no objection. The coroner's comment was to the effect that the written consent of the patient should be obtained if possible. Certainly the most desirable course, but one which it is not always possible to follow, is to obtain the signature of the patient to a written consent, or the patient's verbal consent in the presence of a witness or witnesses. Further, the reasons for the operation and its possible consequences should be explained to the patient, and any consent in writing should acknowledge that this has been done. In the case of children the consent should be that of a parent or guardian. The above, no doubt, is the ideal course, but in hospitals there must necessarily be occasions when an operation presents the only possible, albeit uncertain, means of saving life, and when the patient is not in a condition to give or to refuse consent. Also, when this occurs there may be no relative present, and it may not be possible to communicate with any relative without such delay as would endanger the patient's life. In such circumstances as these it is clearly the surgeon's duty to do his best in the patient's interest, and it may be pointed out that the presence of the latter in the hospital, if voluntary, is in the nature of a submission to the treatment to be decided upon by its staff. In the case of a man who is brought into a hospital as the result of an accident, and operated upon at once as the only possible means of saving his life, although his consent could not be obtained, it is hardly conceivable that relatives would complain or that a coroner or jury would listen to them if they did. The case of Beatty *v.* Cullingworth, in which a female patient sought for damages from a surgeon on the ground that, having obtained her consent to the removal of one of her ovaries, he eventually removed both, will be remembered. It points to the desirability of any authorisation of an operation being in general terms, so that the surgeon may be free to act as conditions may dictate.

The Conduct of Maternity Homes.

The keeper of a maternity home at Lewisham, the registration of which had been cancelled by the London County Council, appealed to the magistrate sitting at Bow-street. Mr. Graham Campbell, having reserved his decision for consideration, dismissed the appeal. The registration had been cancelled on account of the evidence as to the conduct and character of the appellant and as to the unsuitability of the premises and their equipment for their purpose. The magistrate upheld the decision of the Council on both points, and made an order that the appellant should contribute £50 towards the cost of the appeal. No one who has read the evidence as reported can doubt the correctness of this decision on the facts deposed to by the witnesses. With regard to the question of the appellant's moral character, it is, of course, desirable for all keepers of nursing homes to be persons of good character. In the case of establishments maintained for profit in order that women may be delivered of children in them, it is absolutely essential if the evil results connected with the traffic in "unwanted" babies are to be controlled.

The Duty of Anyone Finding a Dead Body.

In the case of the death of a girl named Irene Munro, apparently murdered near Eastbourne on the night of August 19th, comment upon any matters connected with the alleged crime would now be out of place. It is, however, permissible to deplore the delay which apparently intervened between the finding of the dead body by a child accompanied by his mother and the informing of the police. Not only did this postpone investigation generally and quite unnecessarily, but it had as its result that the first medical examination of the corpse on the spot where it was found was made several hours later than it need have been, and at night instead of by daylight. To leave a dead body undisturbed is clearly right, in view of a possible crime, but to communicate the fact of its discovery immediately to the authorities is the simple duty of any citizen, and withal an act of common-sense.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Dangerous Economies of the Dublin Corporation.

THE economies resulting from the deadlock between the Dublin Corporation and the Government concerning the payment of Government grants towards local services are extending even further than was outlined in this column a week ago. Not only is the entire service as regards tuberculosis to cease, unless—an unlikely event—it can be carried on by public subscription, but the housing, the public health service, the provision of school meals for children, and other activities directly concerning the health of the people are all being seriously interfered with. Contributions to the Dublin Union and to the Richmond Asylum are to be decreased, so that these two necessary institutions will also suffer. Moreover, all employees of the corporation, of every rank, are to have 25 per cent. of their salaries or wages held back for nine months from Oct. 1st. It is likely that other public bodies will decide to exercise similar crippling economies, and the health of the country is bound to suffer.

The late Mr. Robert Campbell.

The Belfast Medical School and the whole profession in the North of Ireland have sustained a great loss by the death, on Sept. 6th, of Mr. Robert Campbell. Mr. Campbell had been for years one of the most sought-after consulting and operating surgeons in Ulster. In March of this year he had a cerebral hæmorrhage, from which he recovered sufficiently to resume practice, but three weeks ago an acute attack of Bright's disease, the chronic nephritis from which he had suffered since his boyhood, became acute and he died from uræmia in his fifty-fifth year. The son of a clergyman, Mr. Campbell was born at Templepatrick, County Antrim, and was educated at the Royal Academical Institution and later at Queen's College, Belfast. He obtained the Coulter exhibition (for clinical excellence) at the Royal Victoria Hospital in 1891, and graduated M.B. R.U.I. in 1892, and became F.R.C.S. Eng. in 1896, when he started practice in Belfast. In 1898 he was appointed surgeon to the Belfast Hospital for Sick Children, and in 1900 he became assistant surgeon to the Royal Victoria Hospital, Belfast. With these two institutions he remained connected until his death. During the war he was surgeon to the Ulster Volunteer Force Hospital. Mr. Campbell was a member of that body of able professional men in Belfast who owed much of their subsequent success to the thorough training in anatomy they received from one of the most inspiring teachers of his time—the late Dr. Redfern, professor of anatomy at Queen's College, Belfast; and they revolutionised surgery in the North of Ireland. His publications include "The Operative Treatment of Hernia in Infants and Young Children, Illustrated by 114 Consecutive Cases," published in THE LANCET of Jan. 9th, 1904, and articles on the operative treatment of perforated typhoid ulcer, thyroidectomy for exophthalmic goitre, and acute appendicitis, in the Transactions of the Ulster Medical Society, of which he was at one time President. Mr. Campbell had the complete confidence of those of his professional brethren who were best able to judge of his skill, while the public at large were impressed with what to them is, after all, the real test, the success of his operative work. Mr. Campbell was a strong personality, dogged, persevering, and

determined (despite his own ever-present ailment) to do the very best for his patients in any emergency. He possessed the rare power attributed to the Greeks of thinking before he acted and of acting too. With a rather reserved and silent manner, he was full of the keenest humour. His strenuous life, his splendid work, and his upright conduct will long be an example to be followed in the Belfast Medical School.

Officialdom and War Pensions.

The proposal made at the last meeting of the Tyrone War Pensions Committee to appoint two whole-time sub-secretaries for the different sub-committees met with much criticism. Dr. E. C. Thompson said new officials were unnecessary, and would only add to the already intolerable burdens of the county. If the Pensions Ministry would only diminish and revise their regulations, there would be little difficulty in carrying on all the work necessary for wounded soldiers. The general feeling was that the interests of the wounded men were being submerged in officialdom, and that the men wanted their pensions arranged at once and to be released from hospital. A resolution embodying these views having been proposed, it was seconded by Dr. Thompson, passed unanimously, and sent to the Ministry of Pensions.

Sept. 14th.

Public Health.

REPORTS OF SCHOOL MEDICAL OFFICERS.

CARLISLE.

Of the 7100 children in average attendance at the schools in Carlisle during 1919 more than half (3630) were medically inspected at the routine examinations, or as special cases, or at visits of reinspection during the year. Of the first-named group, numbering 2814, 35 per cent. were found to be suffering from some defect requiring immediate attention, and a further 28 per cent. were directed to be kept under observation.

Nutrition was considered defective in 9·23 per cent., but only in three children was any actual treatment required. Cleanliness on the whole is improving, as shown by a table of the conditions found during the last ten years; but at two surprise visits vermin were found in the heads of girls in 9·3 and 5·9 per cent. respectively, and nits in 26 and 27·9 per cent. of the 3000 odd children examined. This shows that a great deal has still to be done in the way of education of the parents as to their duties. No arrangements are made by the education committee for the cleansing of verminous children, and Mr. Joseph Beard, who presents this report as medical officer of health and school medical officer, doubts if much benefit would result therefrom. There were only 33 cases of scabies found at the routine examinations, the total number found being 146, a considerable improvement over the two years preceding. There were only 11 cases of ringworm among the code group children, but the total number of cases was 115, and 13,289 "school days" were lost (averaging 116 per child). X ray apparatus has been installed and no doubt there will be a considerable saving of school time during the present year. Thirty-one children were found to be suffering from organic heart disease, but in only 2 cases was treatment considered necessary; the remaining 29 children, together with 37 cases of functional heart disease, are noted as to be kept under observation. It may be permissible to doubt whether *any* child with definite organic disease of the heart can be properly considered *not* to require treatment—that is, not only careful management and supervision with regard to diet, exercise, and instruction, at home, in the school-room, and the playground, but also medical examination at frequent intervals to determine the cardiac condition. If merely recommended "to be kept under observation" such cases are apt to be overlooked. Sudden death from morbus cordis in school or in the playground is a catastrophe to be guarded against in every possible way.

With regard to visual defects, it is stated that 583 children were referred for examination by the oculist; out of 186 cases of refractive error, hypermetropia and hypermetropic astigmatism accounted for 138, while of myopia and myopic astigmatism there were only 32 cases. Except for measles (670 cases), which was prevalent from September to December, there was no epidemic outbreak of importance.

A very interesting account is given of the results of tuberculosis treatment during recent years in Carlisle. The disease became notifiable in 1911; since then 732 children under 14 have been notified, of whom 362 were males and 370 females; 530 suffered from pulmonary tuberculosis, and of these cases the disease has been arrested in 63 per cent., while in 10 per cent. it is still active; among the remainder 52 are known to have died, 3 have been killed on active service, and 72 cannot be traced. Of 113 children who received sanatorium treatment for the lung affection the disease has been arrested, or is quiescent, in 76; in 26 the disease has not been arrested, 7 have died, and 4 cannot be traced. Among 50 cases of glandular tuberculosis the disease has been arrested in 42. Of 732 children notified as suffering from all forms of tuberculosis in the period 1911–1918, in 60·8 per cent. the disease has been arrested, in 9·6 per cent. it is still active, 16·9 per cent. have died; the remainder (12·7 per cent.) cannot be traced. "The high percentage of cases arrested or cured is extremely gratifying, and is a distinct encouragement to take all steps possible to search out tuberculosis in its early stages and apply prompt treatment."

CARDIGANSHIRE.

In Cardiganshire previous to 1919 there had been no medical inspection of school children for more than two years. During 1919 it was resumed and 3006 children were systematically examined, besides 187 special cases. In only 653 cases were the parents present.

Not more than 29 children (of whom 27 were boys, according to the table on p. 12 of the report) were returned as "ill-nourished," but Dr. L. Meredith Davies, the school medical officer, states that "the general physique of the majority of the children is very poor." The two statements are difficult to reconcile. A child may be below normal as regards physical development and yet be in good health; but if the general physique is considered to be "very poor" it seems inconsistent to return "malnutrition" in only 29 cases out of 3000 children. In regard to provision of a mid-day meal there are difficulties. No doubt many of the children come some considerable distance to school. It appears that in eight schools some provision is made, but 78 schools "either do nothing or provide hot water or tea or cocoa." The condition of the schools as regards sanitary matters appears to be in many instances unsatisfactory; insufficient water-supply and washing arrangements, the continued existence of middens and privies, and inadequate methods of sewage disposal are mentioned. Dry cleaning and dusting of the school-rooms is still the common practice. As Dr. Davies says, "it is mostly by means of education that one can hope to improve the deplorable condition which exists." Some useful suggestions are made, which, it is to be hoped, may speedily be carried out; these include provision for drying children's clothes, as many of them "have several miles to walk in the morning before reaching school," and arrangements for children coming from a distance, by which "the meals should be served in an orderly fashion, with tablecloth and proper cutlery on the table. Teachers and monitors should be appointed to superintend the meals." (The educational value of such a meal might be considerable.) The provision of dual desks, and the importance of the proper direction and regulation of window lighting are also very rightly insisted on. Many other matters of educational and sanitary importance are dealt with in this interesting report, which, unfortunately, has many typographical errors; these, however, as well as many of the conditions calling for improvement in the schools referred to, may perhaps be attributed to difficulties of communication. The "sweet shire of Cardigan" yields to none in the Principality for historical interest and beauty of scenery, but its railways are few and roads none of the best. Improvement will come in time.

CHESTERFIELD.

At Chesterfield 1726 children were systematically examined in the code groups during 1919, as well as 316 special cases.

The nutrition was on the whole satisfactory, only 12 among these 1726 children being considered to be badly nourished. (Table, p. 9. In table on p. 14, referring to nutrition, and also apparently applying to the same groups of children, 25 are stated to be badly nourished). The most numerous defects found were those of the teeth (7·65 per cent.), throat (4·86), and vision (4·40). Only 4 cases of pulmonary tuberculosis were definitely diagnosed (0·23 per cent.), but the disease was suspected in 22 other children (1·27 per cent.). No provision for open-air classes has yet been made in Chesterfield. Dr. R. Fraser urges the importance of this matter, and points out that it would be quite easy to arrange for classes to be held in the playgrounds, suggesting also that open-air instruction might be carried out in the parks of the town, as has been done at Nottingham. Free dinners were provided from November to February for 241 school children, 78·8 per cent. of these being the children of strikers. The cost of

the meals (meat and vegetable stew, followed by a milk pudding) averaged 5*d*. per child, and the results were evidently satisfactory. There was no infectious disease of importance in any school necessitating closure except a few cases (3) of scarlet fever at Hasland C.E. school, but measles (127 cases) and influenza (155) were somewhat prevalent.

URBAN VITAL STATISTICS.

(Week ended Sept. 11th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·9, 9·9, and 10·0 in the three preceding weeks, rose to 10·3 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 10·0, or 0·3 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 4·4 in Merthyr Tydfil, 5·1 in Reading, and 5·6 in Southend-on-Sea, to 18·3 in West Hartlepool, 18·7 in Dewsbury, and 18·8 in Warrington. The principal epidemic diseases caused 259 deaths, which corresponded to an annual rate of 0·8 per 1000, and comprised 171 from infantile diarrhœa, 38 from diphtheria, 20 from whooping-cough, 14 from measles, 12 from scarlet fever, and 4 from enteric fever. The deaths from infantile diarrhœa, which had increased from 87 to 171 in the five preceding weeks, were again 171, and included 43 in London, 10 in Liverpool, and 9 each in Birmingham and Hull. The mortality from the remaining diseases showed no marked excess in any of the large towns. There were 2633 cases of scarlet fever and 1484 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2402 and 1404 respectively at the end of the previous week. The causes of 19 of the 3506 deaths in the 96 towns were uncertified, and included 2 each in Birmingham, Warrington, Manchester, Rotherham, and West Hartlepool.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 10·8, 11·1, and 9·8 in the three preceding weeks, rose to 11·2 per 1000. The 239 deaths in Glasgow corresponded to an annual rate of 11·2 per 1000, and included 11 from infantile diarrhœa, 3 each from whooping-cough and diphtheria, and 2 from small-pox. The 69 deaths in Edinburgh were equal to a rate of 10·5 per 1000, and included a fatal case each of infantile diarrhœa and diphtheria.

Irish Towns.—The 112 deaths in Dublin corresponded to an annual rate of 14·1, or 0·4 per 1000 above that recorded in the previous week, and included 17 from infantile diarrhœa. The 132 deaths in Belfast were equal to a rate of 16·7 per 1000, and included 7 from infantile diarrhœa and 2 from scarlet fever.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, J. B., ET FILS, Paris.
La Cure de Diurèse. By Dr. C. Ricard-Pomaréde. Pp. 80. Fr. 3.

BAILLIÈRE, TINDALL, AND COX, London.
Clinical Lectures on Enlargement of the Prostate. With a Description of the Author's Operation of Total Enucleation of the Organ. By Sir Peter J. Freyer, K.C.B., M.D. 5th ed. Pp. viii. + 174. 10*s*. 6*d*.

BENNO RONEGEN VERLAG, Leipzig.
Die Natur und Kultur des Pockenerregers und das Wesen der Pockenimpfung. Eine patho- und nosogenetische Studie zur Sozialhygiene. Von Dr. von Nieken. Pp. 66.

CASSELL AND CO., London.
Clinical Methods. By R. Hutchison, M.D., and H. Rainy, M.D. 7th ed. Pp. 685. 12*s*. 6*d*.

CHURCHILL, J. & A., London.
Massage: Its Principles and Practice. By J. B. Mennell, M.D., with an Introduction by Sir R. Jones, K.B.E., Major-General, A.M.S. 2nd ed. Pp. 536. 21*s*.
A Handbook of Physics and Chemistry. Adapted to the Requirements of the First Examination of the Conjoint Examining Board of the Royal Colleges of Physicians and Surgeons, and also for general use. By H. E. Corbin, B.Sc. Lond., and A. M. Stewart, B.Sc. Lond. 5th ed. Pp. 496. 15*s*.

ENGELMANN, W., Leipzig.
Das Menschliche Gehirn. Auflage III. Von Dr. R. A. Pfeifer. Pp. 124.

UNIVERSITY PRESS, Cambridge.
Fall of the Birth-rate. By G. Udny Yule, M.A. Pp. 44. 4*s*.
Industrial Colonies and Village Settlements for the Consumptive. By Sir German Woodhead, K.B.E., M.D.; and P. C. Varrier-Jones, M.R.C.S., L.R.C.P. Lond. With Preface by Sir Clifford Allbutt, K.C.B., M.A., M.D., F.R.S. Pp. xii. + 152. 10*s*. 6*d*. net.

MANCHESTER FRENCH HOSPITAL.—A course of five post-graduate lectures is being held on Thursdays, in September, at 4.15 P.M. The two lectures still to be given are by Dr. A. C. Magian, on Tubal Abortion (Sept. 23rd) and Ovarian Pregnancy (Sept. 30th). Medical men will be cordially welcomed.

The Services.

THE RANK OF NAVAL MEDICAL OFFICERS.

IT has been decided by the Admiralty that medical officers who entered the Service on or after August 4th, 1914, will not have to pass a qualifying examination for the rank of surgeon lieutenant-commander. These officers, however, when they have obtained between two and six years' seniority in that rank, and after a preliminary course of study, will have to qualify by examination for promotion to a higher grade. Surgeon lieutenant-commanders will be eligible for accelerated promotion according to the class of certificate obtained in the qualifying examination after having been recommended for advancement. Surgeon lieutenant-commanders who fail to pass at a second trial will be compulsorily retired with a gratuity which shall not exceed £100 for each complete year's full-pay service, nor be above a maximum of £1000. Officers who entered the Service before August 4th, 1914, may voluntarily take the course and sit for the examination.

Payment of provision allowance instead of hospital allowance will be made to all medical officers serving in naval hospitals and other establishments at home, with retrospective effect to July 1st, 1919, where the officers victual themselves, and no advantage is obtained from the purchase of provisions at Government rates. In the case of medical officers serving in naval hospitals and establishments abroad the provision allowance should be substituted for the hospital allowance, subject to the conditions stated.

THE COLONIAL MEDICAL SERVICE.

The conditions under which medical men may join the various colonial medical services were set out in the columns of our Students' Number on August 28th, and as we then indicated alterations tending towards improvement in the working of the services were to be expected in the near future.

The Committee appointed in November, 1919, to inquire into the Colonial Medical Services, which included the names of Sir William Leishman, Sir James K. Fowler, and Sir Humphry Rolleston, has now presented a report, the main recommendations of which are as follow: (1) A unified service. Hitherto a candidate has applied for appointment in a special colony; the Committee recommends that in future admission should be to "The Colonial Medical Service." (2) The appointment of a director-general, to advise on all matters relating to the personnel of the Service. (3) That candidates should be recently qualified medical men who have held some resident hospital appointment. (4) The selection of candidates by competitive examination, which might be general for all the public services. Candidates to be interviewed and approved before being examined. The examination would serve, in the Committee's opinion, to bring the existence of the Service before the bulk of the medical profession, to whom it is at present almost unknown.

The report deals with pay—a minimum of £600 per annum is recommended—pensions, leave, and promotion. The hope is expressed that the adoption of the measures suggested may remove the present causes of discontent and raise the Colonial Medical Service to a high place amongst the public medical services of the Empire.

In a letter addressed to the chairman of the Committee and printed as an apppendix to the report, assurance is given of Lord Milner's interest in the recommendations, some of which have already been carried out in particular colonies.

DEATH OF SIR WILLIAM BABTIE, V.C.

Lieut.-Gen. Sir William Babtie died on Sept. 11th in Belgium, where he was spending a holiday. He was born on May 7th, 1859, the eldest son of John Babtie, J.P., of Dumbarton. Educated at Glasgow University, he became M.B. Glasg. and L.R.C.P., L.R.C.S. Edin. in 1880, entering the Army Medical Service in the following year, and reaching the rank of Major in 1893. During the international occupation of Crete in 1897–98 he served as senior medical officer, receiving for his services the C.M.G. Throughout the South African War he was on the staff of the Natal Army, being present at all the actions for the relief of Ladysmith and at the subsequent operations in Natal and Eastern Transvaal. It was at Colenso that he won the Victoria Cross for his courage in attending the wounded under fire and in attempting to save Lord Roberts's son. At this time he was promoted Lieutenant-Colonel and received the medal with five clasps. Along with initiative and great personal courage Babtie's abilities as organiser and administrator had already shown themselves, and after serving from 1901–06 as assistant and from 1907–10 as Deputy Director-General he became in 1914 Director of Medical Services in India, and later filled the same office in the Mediterranean.

Nominally responsible in part for the medical defects in the expedition to Mesopotamia, his work came under the survey of the Commission of Inquiry, which, however, made it clear that his tenure of a responsible post when war broke out had been very brief, while the atmosphere in which he worked was unfavourable to reform. The Army Council therefore justly decided to retain General Babtie's services as Director of Medical Services to the War Office, and in 1916 he was appointed K.C.M.G., being promoted K.C.B. in 1919. Since 1914 he had been honorary surgeon to the King.

AWARD OF THE VICTORIA CROSS.

The King has approved the award of the Victoria Cross to the late Temp. Capt. Henry John Andrews, M.B.E., of the Indian Medical Service—

"For most conspicuous bravery and devotion to duty on Oct. 22nd, 1919, when as senior medical officer in charge of Khajuri Post (Waziristan) he heard that a convoy had been attacked in the vicinity of the post and that men had been wounded. He at once took out an aid-post to the scene of action and, approaching under heavy fire, established an aid-post under conditions which afforded some protection to the wounded but not to himself.

"Subsequently he was compelled to move his aid-post to another position, and continued most devotedly to attend to the wounded.

"Finally, when a Ford van was available to remove the wounded, he showed the utmost disregard of danger in collecting the wounded under fire and in placing them in the van, and was eventually killed whilst himself stepping into the van on the completion of his task."

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lieut. (Dental) F. W. Paul to be Surgeon Lieutenant-Commander (Dental).

ROYAL ARMY MEDICAL CORPS.

Lieut.-Colonel R. J. W. Mawhinny relinquishes the temporary rank of Colonel.

Lieut.-Col. H. S. Roch relinquishes the acting rank of Colonel.

Major T. T. H. Robinson relinquishes the acting rank of Lieutenant-Colonel.

Capt. and Bt. Major M. J. Williamson to be acting Lieutenant-Colonel.

Capt. F. C. Tibbs and Temp. Capts. D. Miller and W. B. Swete-Evans relinquish the acting rank of Major.

Capt. J. C. Preston, from Spec. Res., to be Captain.

Major W. Bruce, from N.Z. Med. Corps, to be Captain.

Capt. N. Cantlie is seconded for service with the Egyptian Army.

The undermentioned Captains are restored to the establishment: W. C. Hartgill, C. D. M. Buckley, T. J. L. Thompson.

Capt. H. L. C. Noel resigns his commission.

Temporary Captains relinquishing their commissions and retaining the rank of Captain: F. C. Plummer and C. G. Burton.

SPECIAL RESERVE OF OFFICERS.

Capt. W. W. Shorten relinquishes the acting rank of Major.

Officers relinquishing their commissions:—Capt. K. D. Murchison (granted the rank of Lieutenant-Colonel). Captains retaining rank of Captain: M. C. Cooper, T. H. Rhys, T. O'Mahoney, H. J. Blampied, S. H. de G. Pritchard, C. A. W. Ramsay, C. Tighe, G. F. Hurst, J. A. Panton, J. W. W. Baillie, M. O. Simpson, R. S. Corbett, F. J. Charlton, E. O. Goldsmith, E. R. Batho, P. S. G. Cameron, D. C. Beaumont, H. G. V. Mence, D. V. Murphy, J. S. B. Forbes, J. McKay, R. S. Aspinall, C. Shearer, J. S. Graig, G. M. S. Smith, R. P. Smith, A. Piney, J. W. W. Newsome, D. J. MacKinnon, J. C. Pyper, C. L. Somerville, J. B. S. Lewis, J. McI. H. Smellie, J. S. Bow, J. Ashforth, L. C. Moore, J. A. Ross, M. J. Cahalane, C. Wood, J. J. Conybeare, W. M. L. Gabriel, W. V. Robinson, R. A. Olphert, A. D. Fraser.

TERRITORIAL FORCE.

Capt. O. Teichman to be Deputy Assistant Director of Medical Services, 2nd London Division.

Major A. C. Oldham and Capt. B. M. Footner are seconded under para. 112, T.F. Regulations.

Capt. E. Alderson to be Major.

Capts. A. M. Davie and A. M. Mackay resign their commissions and are granted the rank of Major.

Captains resigning their commission and retaining the rank of Captain: D. M. Johnston, C. W. Greene, F. C. Pridham, G. C. Soutter.

Supernumerary for service with the Officers Training Corps, Belfast University Medical Unit Contingent, Sen. Div.: Capt. G. G. Lyttle relinquishes his commission.

ROYAL AIR FORCE.

Capt. (acting Lieut.-Col.) J. J. C. Hamilton is transferred to the unemployed list.

INDIAN MEDICAL SERVICE.

Major M. Ba-Ket to be acting Lieutenant-Colonel while commanding a Combined Field Ambulance.

Majors W. S. McGillivray, G. Holroyd, W. E. Brierly, and Capt. G. L. Duncan to be acting Lieutenant-Colonels while commanding an Indian General Hospital.

Capt. J. P. Huban to be acting Lieutenant-Colonel while commanding an Indian Field Ambulance.

Capt. P. B. Bharucha and Temp. Capts. B. B. Shah, W. M. Will, and E. C. Brooks to be acting Majors while Registrars of an Indian General Hospital.

The King has approved the retirement of the following officers: Col. P. C. H. Strickland, and Lieut.-Col. J. Mulvany.

The King has approved of the resignation of Capt. P. S. Connellan.

Temporary Captains relinquishing their commissions: Narayan Lakshman Sheory and Vinayak Mahadeo Phatak (granted the rank of Captain).

Correspondence.

"Audi alteram partem."

NYSTAGMUS AND ILLUMINATION.

To the Editor of THE LANCET.

SIR,—Your annotation on this subject is timely and interesting, as at the present moment the construction of a better miner's lamp is under consideration by a special committee in London. Dr. T. L. Llewellyn is an indefatigable worker, and the point of interest to me in his Brussels paper—a copy of which he kindly sent me—is the much greater effect on illumination that is brought about by whitewashing the walls than by increasing the candle-power of the lamps. He informs me that the effect of stonedusting is not as good as whitewash, but very striking, and that 200 yards of roadway can be stonedusted in less than five minutes by the compressed air method. I hope that he will be able to persuade colliery owners to go a step further than the roads and carry it to the coal face where it is most needed.

As long as ten years ago I advocated introducing colour in coal mines,[1] and expressed the view that the cause of nystagmus was the absence of colour in them, but up to the present I have not heard of anybody agreeing with this theory. The thing that impressed me more than anything else on my first visit to a coal mine was the blackness and gloom of it. It seems almost incredible that miners should be content to work in such surroundings, and that owners do not realise how very different the mines could be made, and what an effect it would have on the workers if the surroundings were more cheerful. Sir Josiah Court, and Dr. Llewellyn up to quite recently, seem to have thought that the way to increase illumination was simply to have lamps with a greater candle-power, and declined to admit that absence of colour had anything to do with nystagmus. And yet the latter recognises that only from 3–10 per cent. of light is reflected, all the rest being lost by absorption by the black coal. To throw a great light on a black surface is a truly wasteful method of illumination. Now that roadways have been whitewashed it will be interesting to hear how much nystagmus occurs among men working in them. As far as I know there is none.

In a paper on Colour and Light in Relation to Miners' Nystagmus which I read at the Oxford Ophthalmological Congress in 1912[2] and again at the recent discussion by the Illuminating Engineering Society,[3] emphasis was thrown on the importance of colour in mines, not only of the colour of the surface, but also of the colour of the light thrown on that surface. Lately things seem to be moving, and colour is being put into mines—but not enough yet—and also into miners' lamps by at least one manufacturer, who makes a lamp with a yellow globe. The light from this, although not perfect, is far preferable to the bluish light from a metallic filament lamp. On the whole, I fancy that Dr. Llewellyn and others may now be inclined to attach more importance to colour than formerly. Probably the vitiated air in mines is another factor that should not be ignored.—I am, Sir, yours faithfully,

Ebbw Vale, Sept. 12th, 1920. H. S. ELWORTHY, F.R.C.S.

WHEN IS AN ADVERTISEMENT NOT AN ADVERTISEMENT?

To the Editor of THE LANCET.

SIR,—In the leading article entitled "Your Telephone Number" in your issue of August 21st you raise the above question, and the answer is not easy. One might suggest various other questions of advertisement. Is publishing one's name in "Who's Who" an advertisement? I have been told that it is one of the best. Is writing a book on some specialty and advertising it in

[1] Brit. Med. Jour., Nov. 19th, 1910.
[2] Ophthalmoscope, December, 1912.
[3] Illuminating Engineer, March, 1920.

the medical papers, year in and year out, an advertisement? The sale of the book cannot pay for it. And, lastly, what is the distinction between the Post Office Directory and the Telephone Directory? In the former, for the last 20 odd years, my name, in conjunction with most of my fellows, has appeared in the "commercial" section as "Ophthalmic Surgeon," with telephone number and address; also in the "trades" section, under the heading of "Surgeons: Ophthalmic." I have not looked at a Post Office Directory for many years, and being out of town I cannot at present refer to one; but at the time when my name first appeared there, most of the well-known ophthalmic names were on the list.

In old days, "ophthalmic surgeons" and "aurists" were, I think, the only two specialists advertised, but there may be other headings now. We had to pay 5*s*. for the insertion in the "trades" section, and for some time I refused, feeling that it was nothing but pure advertisement. But when I found that nearly all the leading ophthalmic men, from the President of the Ophthalmological Society downwards, had their names in, I felt it useless to protest, and followed suit. Now, the 5*s*. payment has been dropped, but my name still appears. As to the value of the advertisement, it appears to be nil; at least, I have no knowledge of ever having had a patient through the Post Office Directory.

As regards your other point: Why pay a guinea? Years ago, in the days of the old telephone company, I suggested to them that it would be a great convenience to have a medical section of the Telephone Directory. They thanked me for the suggestion, but were not prepared to face the expense. Well, if a progressive telephone company would not face the expense, how much less will a government department, which can only run the telphone at a loss?

To a great extent the Telephone Directory has become one's address-book, and to be left out may cause trouble and loss, as I have recently found to my cost, my name having been omitted in error from the last issue. The proposed addition would be a great convenience for purposes of cross-reference, but as a positive advertisement it would have no value.

I am, Sir, yours faithfully,

RAYNER D. BATTEN.

Wimpole-street, W. (Mayfair 4353), Sept. 6th, 1920.

GUINEA-PIG OR CAVY.

To the Editor of THE LANCET.

SIR,—In your last issue (p. 546) Professor H. B. Day, in describing some inoculation experiments, says that fluid was injected into "guinea-pig (A)," and later "half was injected into pig (B)." What did he actually do? Was the second animal a real pig, a hog, or was it, as appears most likely, a second guinea-pig? One may bear with resignation, if without much cheerfulness, the cheery enthusiasm which translates the inoculation of experimental animals into "pumping bugs into bunnies," and the like, so long as it does it in decent privacy in the laboratory. But when you, Sir, connive at the registration of such loose talk in a medical journal, I think it is time to make some protest. A pig is one thing and a guinea-pig is another, and if bacteriologists are not sufficiently grateful to the latter animal to give it its proper name, I would suggest that "cavy" might be made more general. It was, I think, Linnæus who said, "Nomina si nescis perit et cognitio rerum."

I am, Sir, yours faithfully,

Branscombe, Sept. 12th, 1920. A. E. BOYCOTT.

VOLUNTARY HOSPITALS AND THE SPIRIT DUTY GRANT.—We understand that the Ministry of Health and the Scottish Board of Health are prepared to receive applications from voluntary hospitals for grants in respect of payment of duty involved by the use of duty paid spirit or drugs containing duty paid spirit for medical and surgical purposes. Forms of application have been sent to those hospitals to which a grant was paid last year. Any other hospital which desires to make application should communicate immediately with the Secretary to the Ministry of Health, Whitehall, London, S.W.1, or the Secretary to the Scottish Board of Health, Edinburgh, as the case may be.

Medical News.

UNIVERSITY OF LONDON. — A course of four lectures on Aids to Study will be given at University College by Dr. Charles E. Pearman, Grote Professor of Mind and Logic in the University of London, member of the Faculty of Medicine, on Tuesdays, at 5 P.M., beginning on Oct. 12th. The course is designed for first year students only, and will embody some practical results of psychological work with regard to learning and memorising.

UNIVERSITY OF PARIS.—A psychological institute is about to be established under a council of directors consisting of the following five professors—MM. H. Delacroix, G. Dumas, P. Janet, H. Piéron, and E. Rabaud, associated with the deans of the Facultés des Lettres et des Sciences, MM. F. Brunot and F. Houssay. The institute will undertake the practical and theoretical teaching of all branches of psychology—physiological, experimental, pathological, comparative, and general. The institute of pedagogy, founded last year, will be attached to the institute of psychology, of which it will form a section. The diploma course will consist of two terms, and, moreover, research can be carried out in the laboratories of the institute, under the supervision of the professors, in preparation for university degrees. Applications for admission should be sent any time after Oct. 15th to the Bureau des Renseignements de l'Université de Paris, at the Sorbonne.

EPSOM COLLEGE PENSIONS AND SCHOLARSHIP.—The Council of Epsom College will shortly award several France pensionerships of £30 a year to aged medical men in reduced circumstances; also a Home scholarship of £30 a year to the necessitous orphan daughter of a medical man who was for not less than five years in independent practice in England or Wales. Particulars can be obtained from the secretary of the College, 49, Bedford-square, London, W.C. 1.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC.—A two months' post-graduate course in neurology will be held, starting on Oct. 4th. The fee for the course will be £7 7*s*., but holders of the Fellowship of Medicine ticket will be admitted free. Further particulars will be announced in our Medical Diary in a future issue.

INDUSTRIAL WELFARE SOCIETY.—The first lecture conference for welfare supervisors is being held at Balliol College, Oxford, from to-day (Friday) until Sept. 20th. The men attending are engaged in welfare work in industries of every kind. On Saturday, at 4.30 P.M., Mr. B. Muscio lectures on Industrial Psychology, and on Sunday, at 11 A.M., Dr. E. Halford Ross deals with Health in Industry. The secretary of the conference is Mr. C. Cullen, who may be addressed at Balliol College.

ORTHOPÆDIC CENTRE AT NEWCASTLE. — The orthopædic extension of the Royal Victoria Infirmary, which has actually been in occupation for some time, was formally opened on Sept. 9th by the Duke of Northumberland. The institution is fitted with all modern appliances and apparatus, including X rays, various forms of baths, and curative workshops; these include shops for carpenters, basket-makers, hairdressers, watchmakers, engineers, blacksmiths, and bootmakers, as well as printing and stencilling departments. The new buildings occupy 15 acres and have cost £160,000, of which £12,000 has still to be raised; there is accommodation for 500 in-patients, and the out-patients number well over 1000.

LECTURES ON INFANT CARE.—The National Association for the Prevention of Infant Mortality and for the Welfare of Infancy announce a special course of lectures on Infant Care for health visitors, nurses, teachers, and infant welfare workers to be held in the lecture theatre, University College, Nottingham, from Sept. 20th to 24th inclusive. Two lectures will be given each day, and the lecturers will include Dr. J. Sim Wallace, Dr. H. C. Cameron, Dr. J. W. Ballantyne, Lady F. Barrett, M.D., Dr. G. Margaret Dobrashian, and Miss J. Halford. The association announce also a course of elementary lectures on Infant Care, for infant welfare workers, teachers, and mothers, to be held at Morley Hall, George-street, Hanover-square, London, W. 1, on Mondays at 6-7 P.M., from Sept. 27th to Dec. 13th. Under the joint auspices of this association and of the National Society of Day Nurseries a course of advanced lectures on Infant Care, especially intended for creche nurses and probationers, will be held at Essex Hall, Essex-street, Strand, London, W.C. 2, on Thursdays, at 7.30 P.M., from Sept. 30th to Dec. 16th. Tickets for all three courses of lectures at 10*s*., 7*s*. 6*d*., and 10*s*. respectively can be obtained from Miss J. Halford at 4, Tavistock-square, London, W.C.1.

MEDICAL WOMAN MAGISTRATE.—Dr. Janet E. Lane-Claypon, Dean of the Household and Social Science Department, King's College for Women, has been made a justice of the peace for the County of London.

LORD HAIG'S DISABLED OFFICERS' FUND.—Lord Haig's appeal to sportsmen has already met with considerable success. That cricketers have not been slow to respond is testified by the exciting match at the Oval, which commenced on Monday last, between the Champion County and the Rest of England, when half the proceeds were given to the Fund. The big match on the Chelsea ground is evidence that football is doing its share and other sections of sport are contributing their quota.

Mr. Henry J. Taylor, honorary ophthalmic surgeon to the Bolton Infirmary, was presented at Preston, on Sept. 14th, with the Royal Humane Society's certificate on vellum for an attempt to rescue a man who had thrown himself into the flooded Ribble. Mr. Taylor, who is 55 years of age, dived in fully clothed, but his retriever dog followed and clung to his coat, preventing him from reaching the man, who was drowned.

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The old students' dinner will take place in the Guildhall, and not in the Great Hall of the Hospital, as previously notified. This alteration has been made owing to insufficient accommodation. Other arrangements remain the same as announced in our issue of Sept. 4th.

ST. BARTHOLOMEW'S HOSPITAL NURSES' HOME.—The plans of building for Queen Mary's Home for nurses in training at St. Bartholomew's Hospital have been approved and the first block is to be commenced at once. The cost of a room and all that goes with it is £350, and certain rooms have already been named according to the wish of the subscribers. Special features of the proposed home include a separate bedroom for each nurse, a lecture theatre, a library, recreation rooms, numerous bath and shampoo rooms. The present amount of the fund is £100,000 and an equivalent sum is still required. Contributions should be sent to Mr. W. McAdam Eccles, at St. Bartholomew's Hospital, London, E.C. 1.

THE LATE DR. RUTHERFOORD HARRIS.—On Sept. 2nd Dr. Frederick Rutherfoord Harris died at Eastbourne at the age of 64. Son of a judge in Madras and educated at Leatherhead Grammar School and abroad, he studied medicine at Edinburgh University, qualifying M.R.C.S. Eng. in 1889 and L.R.C.P. Lond. in the following year. For a while he practised medicine in Kimberley. He then became associated with Cecil Rhodes, who appointed him secretary of the British South Africa Company. South African and later home politics then became his chief interest, combined with sport of all kinds. He was Member for Kimberley in the Cape Parliament, and in 1903 was returned to the House of Commons as Member for Dulwich, sitting there for three years. Even when politics brought him constant trouble and disappointment he never returned to the practice of his profession, but led a retired life for some years before his death.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN, Hunter-street, Brunswick-square, W.C.
Post-Graduate Course on Venereal Diseases for Medical Women.
A Course arranged by the London (Royal Free Hospital) School of Medicine for Women, the Royal Free Hospital, the Elizabeth Garrett Anderson Hospital and the London Lock Hospital, for the instruction of qualified medical women in the Treatment of Venereal Diseases. The Course will extend over two weeks.
MONDAY, Sept. 20th.—5 P.M., Mrs. Rorke, M.B.: Out-patient Cliniques for Women and Children (at the Royal Free Hospital, Gray's Inn-road).
TUESDAY.—9.30 A.M., Injections (at the London Lock Hospital, 283, Harrow-road, W.) 2 P.M., Mr. C. Gibbs: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road). 6.30 P.M., Dr. Ruth Balmer: Out-patient Cliniques for Women and Children (at the Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.)
WEDNESDAY.—9 A.M., Dr. Morna Rawlins: Visit to Maternity Wards and Labour Department (at the London Lock Hospital, Harrow-road). 11 A.M., Dr. Mary Schofield: Pathological Demonstrations (at the Royal Free Hospital). 3.30 P.M., Mr. J. E. Lane: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road).
THURSDAY.—9.30 A.M., Mrs. Rorke, M.B.: Visit to Venereal Disease Hostels. 2 P.M., Mr. J. E. R. MacDonagh: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road). 5 P.M., Mrs. Rorke, M.B.: Injections (at the Royal Free Hospital).
FRIDAY.—10 A.M., Mrs. Rorke, M.B.: Treatment Ante-natal Cases (at the Royal Free Hospital). 5 P.M., Mr. J. J. Abraham: Injections and Out-patient Clinique for Women and Children (at the London Lock Hospital, 91, Dean-street, W.). 6.30 P.M., Dr. Ruth Balmer: Out-patient Cliniques for Women and Children (at the Elizabeth Garrett Anderson Hospital).
SATURDAY.—9.15 A.M., Injections (at the Elizabeth Garrett Anderson Hospital).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Sept. 20th.—2 P.M., Mr. B. Harman: Eye Department. 2 P.M., Mr. MacDonald: Surgical Out-patients.
TUESDAY.—10 A.M., Dr. McDougal: Electrical Department. 2 P.M., Dr. T. Gray: Surgical Out-patients.
WEDNESDAY.—2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Mr. Addison: Operations.
THURSDAY.—2 P.M., Dr. G. Stewart: Medical Out-patients. 2 P.M., Mr. MacDonald: Surgical Out-patients.
FRIDAY.—2 P.M., Mr. Banks Davis: Diseases of the Throat, Nose, and Ear. 2 P.M., Dr. Pernet: Skin Department.
SATURDAY.—2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.
Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.
MONDAY, Sept. 13th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street (behind Whitworth Park).
THURSDAY, Sept 23rd.—4.15 P.M., Dr. A. C. Magian: Tubal Abortion.

Appointments.

BREWER, D., M.R.C.S., L.R.C.P. Lond., D.P.H., has been appointed Medical Officer of Health for the Borough of Swindon.
BROADFOOT, J., M.B., Ch.B. Glasg., Certifying Surgeon under the Factory and Workshop Acts for Dingwall.
MAYLARD, A. E., M.B., B.S. Lond., one of the Medical Referees under the Workmen's Compensation Act, 1906, for the Sheriffdom of Lanark.
TANNER, W. E., M.S., F.R.C.S., Assistant Surgeon to the Prince of Wales's General Hospital, Tottenham.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. M.O. £500.
Abergavenny, Monmouthshire Asylum.—Jun. Asst. M.O. £300.
Ayrshire Sanatorium, Glenafton, New Cumnock.—Res. Asst. £250.
Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £250.
Barrow-in-Furness, North Lonsdale Hospital.—Sec. Res. H.S. £225.
Battersea General Hospital (Incorporated), Battersea Park, S.W.—Third Res. M.O. £200.
Bedford County Hospital.—Asst. H.S. £150.
Bethnal Green Infirmary, Cambridge-road, Bethnal Green, E.—Two Jun. M.O's. £400.
Birmingham General Hospital.—Surg. Registrar. £200.
Brighton, Royal Sussex County Hospital.—Jun. H.S. £150.
British Guiana.—Asst. M.O.H. £600.
Carnegie Dunfermline Trust.—Asst. M.O. £500.
Central London Ophthalmic Hospital, Judd-street St. Pancras.—H.S. £100.
Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S. £250.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £100. Also Tuberc. O. £600.
Colchester, Essex County Hospital.—H.S. £200.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Coventry and Warwickshire Hospital, Coventry.—Hon. P.
Derby Borough Mental Hospital.—Asst. M.O. £350.
Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £200.
Devonport, Royal Albert Hospital.—H.S. £200.
Durham University College of Medicine, Newcastle-upon-Tyne.—Lecturer on Med. Jurisprudence.
East Africa.—M.O. to C.M.S., Kavirondo.
Eastbourne, Princess Alice Hospital.—Res. M.O. £175.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.S. and H.P. £125.
Egyptian Government, School of Medicine.—Prof. of Pharmacology. L.E. 1.200–1.440. Lecturer in Anat. L.E. 720.
Glamorgan County Asylum, Bridgend.—Jun. Asst. M.O. £350.
Glasgow District Mental Hospital, Gartloch, Gartcosh.—Asst. M.O. £350.
Heywood Borough.—M.O.H. £600.
Hospital for Sick Children, Great Ormond-street, W.C.—Cas. M.O. £200. Also Asst. Cas. M.O., H.S., and H.P. £50 each.
Huddersfield Royal Infirmary.—Asst. H.S. £150.
Hull City Asylum, Willerby, near Hull.—Jun. Asst. M.O. £300.
Hull Royal Infirmary.—Asst. H.S. £150.
Ingham Infirmary and South Shields and Westoe Dispensary.—Jun. H.S. £175.
Johannesburg, South African School of Mines and Technology.—Professorship of Vet. Anat. £860.
Kensington Board of Guardians Infirmary, Marloes-road.—Pathologist. £300.
Lancaster County Asylum.—Asst. M.O. £300.
Leeds City.—Asst. M.O. £500.
Leicester Royal Infirmary.—H.P. £200. Also Res. Anæsth. £250.
Lincoln County Hospital.—Jun. H.S. £150.
Liverpool Royal Infirmary.—H.P.'s, H.S.'s, & Sen. Cas. O. £60 each.
Macclesfield General Infirmary.—Res. H.S. £200.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Maidstone, Kent County Ophthalmic Hospital.—H.S. £300.
Maidstone, West Kent General Hospital.—Two H.S.'s. £220.
Manchester, Ancoats Hospital.—Res. Surg. O. £250.

Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—H.S.
Manchester, St. Mary's Hospitals for Women and Children.—H.S. for Whitworth Park Hospital. £100.
Manchester Royal Infirmary, Central Branch, Roby-street.—Res. M.O. £250.
Margate, Princess Mary's Hospital for Children, Cliftonville.—Jun. Asst. M.O. £515 6*s*.
Metropolitan Asylums Board Infectious Hospitals Service.—Jun. Asst. M.O.'s. £515 6*s*.
Middlesbrough Education Committee.—Sch. Dent. £400.
Ministry of Pensions, London Region.—Med. Referee (Marylebone Borough).
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Out-patient M.O. £150.
National Hospital for the Paralysed and Epileptic, Queen-square, Bloomsbury, W.C.—Registrar. £200. Also Sen. H.P. £150.
Newcastle-upon-Tyne City Mental Hospital, Gosforth.—Sen. Asst. M.O. £500.
Northampton General Hospital.—H.S. £200.
Nottingham City Education Committee.—Jun. Asst. Sch. M.O. £500.
Pontypridd Urban District Council.—Female Asst. M.O. £550.
Prince of Wales's General Hospital, Tottenham, N.—H.P. and H.S. £200. Jun. H.S. and Jun. H.P. £120.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.S. £100.
Reading, Royal Berkshire Hospital.—H.P. and Second H.S. £200 each.
Royal London Ophthalmic Hospital, City-road, E.C.—Asst. M.O., Department for Venereal Diseases. £1 1*s*. a session.
St. Mary's Hospital, Paddington, W.—Res. Asst. Anæsth. £100.
Salford Royal Hospital.—Res. Surg. O. £250. H.P. £200. H.S., Jun. H.S., and Cas. H.S. £150 each.
Scarborough Hospital and Dispensary.—Two H.S.'s. £150.
Sheffield Royal Hospital.—Asst. Cas. O. £150.
Sheffield Royal Infirmary.—H.S. for Ear, Nose and Throat. £150.
Sheffield University, Department of Pathology and Bacteriology.—Director. £800. Asst. Director. £500. Curator of Path. Museum. £600.
Southampton County Borough.—Asst. M.O.H. £500.
Sydney University, New South Wales, Australia.—Chair of Dentistry. £1100. Also Chair of Physiology. £1150.
Taunton and Somerset Hospital.—Jun. H.S. £150.
Uganda.—M.O. to C.M.S. Mengo Medical School.
Wakefield, Clayton Hospital.—Sen. H.S. £250. Also Jun. H.S. £200.
West Hartlepool, Cameron Hospital.—H.S. £300.
Westmorland Sanatorium and Home, Meathop, Grange-over-Sands.—Res. Asst. M.O. to the Westmorland Sanatorium and Asst. Tuberc. O. for Westmorland. £350.
Winchester, Royal Hampshire County Hospital.—H.S.
Wolverhampton and Staffordshire General Hospital.—H.S. £200.
Woodilee Mental Hospital, Lenzie, near Glasgow.—Asst. M.O. £350.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.
Worcestershire County Council.—Sch. Oculist. £550.

The Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Heckington, Chryston, and Staines.

Births, Marriages, and Deaths.

BIRTHS.

ALDRIDGE.—On Sept. 9th, at Magdalene House, Glastonbury, Somerset, the wife of Dr. F. J. Aldridge, of a son.
BUNBURY.—On Sept. 7th, at Highfield, Colsterworth, the wife of E. G. Bunbury, M.R.C.S., L.R.C.P., of a son.
GOODE.—On Sept. 10th, at Bootham, York, the wife of Henry Norman Goode, M.C., M.B., F.R.C.S.E., of a son.
KIRK.—On Sept. 4th, at Treeton House, Bellingham, Northumberland, the wife of Dr. G. W. L. Kirk, of a daughter.
MALONE.—On August 21st, in a Nursing Home, Belfast, the wife of Surgeon Lieut.-Comdr. A. E. Malone, M.B., B.A., Royal Navy, of a daughter.

MARRIAGES.

CONOLEY—COWAN.—On Sept. 9th, at Marlborough House, Glasgow, Oliver Francis Conoley, M.R.C.S., L.R.C.P.; London, to Isobel Margaret, daughter of Jas. N. Cowan, Mount Florida, Glasgow.
HILL—FORTUNE.—On Sept. 7th, at St. John's, Dumfries, Dr. James Gill Hill, M.C., to Julia Violet McNaghten, youngest daughter of Mr. and Mrs. J. Fortune, of Bengairn, Kirkcudbrightshire.
JEPSON—SCOTT.—On Sept. 7th, at St. Mark's, Surbiton, Captain W. Baly Jepson, M.C. (late R.A.M.C.), to Jean Margarita, only surviving child of Mr. and Mrs. R. A. Scott, of Cathay, Surbiton.
MCFADYEAN—MCCORMICK.—On Saturday, Sept. 11th, at Holy Trinity Church, Haverstock-hill, N.W., Kenneth McFadyean, M.R.C.S., L.R.C.P., to Elsie, youngest daughter of Mr. and Mrs. W. A. McCormick, Windermere-avenue, Finchley, N.
WATSON—CHARRINGTON.—On Sept. 8th, at St. Bartholomew's, Leigh, Surrey, Lieutenant-Colonel John W. Watson, C.I.E., I.M.S., to Ruth Mary, daughter of the late Ernest Charrington, and Mrs. Wilfred Hadley, Parkside, Reigate.

DEATHS.

BABTIE.—On Sept. 11th, very suddenly, at Knocke-sur-Mer, Belgium, Lieutenant-General Sir William Babtie, V.C., K.C.B., K.C.M.G.
GUINNESS.—At Nairobi, British East Africa, Wyndham Malan Grattan Guinness, M.D.
JOHNSON.—On Sept. 12th, in London, Obadiah Johnson, M.D., of Marble Hall, Lagos, Nigeria, aged 71 years.
TEEVAN.—On August 20th, at Upper Grosvenor-road, Tunbridge Wells, Henry Teevan, M.R.C.S. Eng., L.S.A., formerly Captain, 75th (Stirlingshire) Regiment.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE UNIVERSITY PROBLEM.[1]

BY SIR EDWARD SHARPEY SCHAFER, F.R.S.

To keep up with the times a university must constantly expand. The mediæval university merely needed intellectual expansion. But the time is past when a university could be physically constituted out of a library and lecture rooms. It is chiefly the extensions imposed upon the universities by the teaching of the natural sciences which necessitate their physical expansion, and we have to consider how such expansion is to be effected. The particular difficulty in providing for the requirements of the natural sciences is the furnishing of adequate laboratory accommodation.

The members who constitute the governing bodies of most universities appear unfortunately unable to appreciate the fact that the university will have a far longer life than its individual members. University buildings are usually so constructed as to be incapable of extension. And in consequence of this lack of foresight a laboratory which has seemed, and perhaps has been, adequate for its purpose at the time of its construction will in the course of 20 years become inadequate. Plans for new buildings are generally drawn up in such a manner that future expansion is barred. So that the problem of adequate *pro*vision presents itself again in a few years, when with proper *pre*vision it might have been settled for many years.

The Ideal Environment.

The idea is unfortunately prevalent in this country that universities should be situated in large cities, but the ideal environment of a university is an Academia—a place for undisturbed work and quiet contemplation, whence the sights and sounds of the city are excluded—not a site in the middle of the town with traffic rumbling past, surrounded as often as not by slums and squalor, by dirty streets with cheap lodging-houses, with music halls and movies in convenient proximity; but with hardly a yard of ground in possession beyond that to be covered by the buildings, and with the possibility of expansion only at enormous cost. If the situation chosen is in a prominent situation the building must have a handsome elevation, increasing the cost hugely whilst generally diminishing its value for the purpose for which it is erected. Is it any wonder, when such large sums have to be paid for site and building, that but little is left for equipment and brains?

Take, for example, the University of London—now University College. About a century ago it occurred to a few people that a university education should be available to any member of the community, whatever his opinion on religion, who might be able to take advantage of the educational privileges offered. A large sum of money was collected, and the site selected was little more than a mile from Charing Cross. Though with the money at their disposal the promoters of the new university might have bought a couple of hundred acres, and still have had money enough for all the building required, they bought a comparatively small plot of land and spent the greater part of their money in erecting an incomplete edifice, provided with a fine dome and portico, but lacking the endowments which are needed to attract and keep the best scholars. Their unwise example has been followed everywhere. No founders of universities in this country realise that every university will need unlimited room for expansion, and that this can only be obtained by the acquisition of land on a large scale at the time the university is founded. The difficulty of getting it later may be insuperable, as, indeed, the attempts to extend the University of London have abundantly shown. One of the present schemes for its expansion contemplates the acquisition of a large area in the neighbourhood of the British Museum, covered with streets and houses. Its carrying out would involve the expenditure of many millions of money, and would only then provide for immediate necessities; in 50 or 100 years far more space will be wanted. The sum needed to promote such an undertaking would be sufficient to provide at least four university centres for London, provided they are set down where an adequate amount of land can still be purchased at a reasonable expense. Why London, with its permanent population of 7 millions and its large floating population, should not have as many universities or university centres as Scotland or Sweden, or more than Ireland or Norway, or Yorkshire—all with smaller populations—is a question which can be rightly answered only in

[1] Abridged from an address delivered at Cardiff to the Medical School of the University College of South Wales.

one way, although up to the present the reply has not taken the direction that common sense would indicate. The longer London waits the further must its universities go afield and the greater will be the cost of establishing them

The Acquisition of Land.

The extreme difficulty of providing sufficient land for expansion within the limits of a city was shown in the experience of Edinburgh University, where a site was secured in the neighbourhood of the existing university building which was found inadequate almost at once on completion of the building. The need for further accommodation has of late assumed an acute form, and further provision for the medical sciences is again urgently demanded. Steps have been taken to obtain a site on which to erect a Lister Institute. For this site, of about two and a half acres, covered by tenement houses, which must be removed before it can be utilised, the large sum of £55,000—about £22,000 an acre—has to be paid; it is estimated that the buildings to be accommodated upon it will cost nearly a quarter of a million of money, and to judge from past experience, the necessity for further expansion will arise before the institute has been long occupied. This will only provide for a single subject. There are many others which are crying out just as loudly for expansion, and to meet their demands a site comprising many acres will soon have to be found.

Fortunately for the future of Edinburgh, the present head of the university has been able to look into the future further than his predecessors, and has persuaded the governing body to purchase a plot of land of about 115 acres on the outskirts of the city, little more than a mile from the existing university, and easily accessible even by present means of conveyance. The site is admirably adapted for a university park or campus with abundance of space for buildings. It will furnish room for an amount of expansion which is not likely to be overtaken within at least the next hundred years. The cost of acquiring this large area of land is little more than half that needed to obtain the two and a half acres wanted for the Lister Pathological Institute. And the transference to it of all laboratories which are not immediately related to clinical work can, in view of the site difficulties within the city itself, only be a question of time. Nor is there any reason why a university hospital should not be one of the laboratories to be erected upon it. For a hospital is, in fact, a laboratory, in which the experiments which nature or accident make upon the human subject are utilised for the treatment and study of disease. Doubtless a large sum of money would be required to carry out the scheme in its entirety. But it will not cost half as much as an attempt to continue the present system, and when the benefits which will accrue are realised there should be little doubt as to which policy will ultimately prevail.

The longer the delay in acquiring land near a growing town the less can be acquired and the more must be paid. Compare the relative values just given. Two and a half acres of town land for £55,000, and 115 acres a short distance away for £28,000. In fifty to a hundred years' time this 115-acre plot would also, under ordinary circumstances, have become town land and have been covered with houses; and even at the present rate for town land the cost would then be more than 2½ million pounds!

I have mentioned this matter because, although the acquisition of a large area of land for university buildings is not only a common but even a constant feature in the United States, this is, so far as I know, the first time the principle has been adopted in our own country.

Every university should have enough land for all purposes. Even 100 acres may not suffice for the university buildings alone. Cornell, founded little more than 50 years ago, already finds a campus of this size inadequate. Besides lecture-rooms and laboratories provision should be made for students' hostels, for athletic grounds, for professors' and lecturers' houses. A university so planned would be self-contained—a small city in itself—within which not only means for instruction, but also for recreation and amusement are provided.

That the university ought to possess more land than even its own probable future necessitates is indicated by the fact that the planting of such an institution in a spacious park tends to stimulate the erection of good houses in its neighbourhood and raises the value of the land around it. Why should not the university have the benefit of this rise in value instead of the speculative builder?

The above considerations render it obvious that a university should acquire, while it can be acquired, enough land not only for present but for all future needs.

The question of site is intimately bound up with the style, arrangement, and cost of the buildings to be erected on it. If the university is free to build laboratories on its own land a simpler and less expensive style of architecture can be adopted, and, moreover, it is unnecessary to provide high buildings; each department can be self-contained, easily capable of extension, and abundantly lighted.

The Advantages of Temporary Buildings.

Not the least advantage of the possession of a campus is the freedom it gives the university to put up temporary buildings, a very real advantage when there is difficulty in obtaining large sums of money. But the advantage of a temporary building is not alone that of economy. Probably no building was ever yet constructed, however carefully, in which it was not found that mistakes had been made which could only be set right with difficulty and expense. In many cases the work and teaching of a new professor has been seriously hampered by having to be carried on in a laboratory designed by his predecessor. There is much to be said, therefore, for the erection, in the first instance, of buildings of a temporary character—so constructed, however, that they may be used with advantage for 50 years or more. There is no laboratory in the world, however expensive and magnificent its construction, which will not be antiquated in the course of 50 or 60 years. Thus, seeing that it can be easily replaced at a relatively small cost, a temporary building may serve its purpose even better than a professedly permanent structure.

The Problems of Expansion.

The crux of schemes for extension is the problem as to whether a university should welcome all who desire to receive instruction within its walls, or should impose a limit upon the number it is willing to admit. It will surely be a calamity if our universities are compelled to refuse admission to genuine students. But it will be a greater calamity to admit them and provide inadequately for their instruction.

Again, by no means the least part of the subject of university expansion concerns facilities for research. Universities were no doubt originally established for teaching, but it is universally recognised that if a high standard of teaching is to be maintained this must go hand in hand with the pursuit of new knowledge. With the growth of science and medicine the necessity is more than ever imperative, and the encouragement of original investigation is to be looked upon as a university function not less important than the imparting of information.

Lastly arises the all-important question of finance. How is the money for university expansion to be provided? For it must be admitted that no university can be self-supporting. There should be no hesitation about the answer: A university education ought to be provided by the State for all who are capable of benefiting by it. Elementary and secondary teaching are already so provided; why make an exception for the highest grade? The benefit of elementary and secondary education is mainly individual: the indirect benefit to the community which is often assumed to result from it is problematical. But education of a university character is an asset of direct value to the community. No elaborate argument is required to prove this. All important progress in science, whether in manufactures, in means of communication, in naval and military matters, in engineering, in medicine, has been the result of purely scientific researches carried on for the most part in universities or in colleges of a university standard. It is therefore not only the *duty* but the *interest* of the State to maintain universities in full efficiency. But no statesman in our country has ever recognised this duty or attended to this interest.

If there could be found a statesman to treat the question of providing for the needs of the universities, not in a niggardly manner or as if it were a question of charity, but as a sound business proposition of direct benefit to the State, how much better a chance should we have not only of maintaining our own material position, but, which is yet more important, of contributing our proper share to the sum of human knowledge and thereby ministering to the happiness and prosperity of mankind!

COLONIAL HEALTH REPORTS.

Leprosy in Rodrigues.

RODRIGUES or Rodriguez is a coral island of 42 square miles extent and with less than 2000 inhabitants, situated in the Indian Ocean some 350 miles east of Mauritius. In a report, submitted by Dr. S. E. Mangenie to the Medical and Health Department of Mauritius, he says there is no doubt that leprosy was introduced into the island by a man known as "Diango," who came from Mauritius about 40 or 50 years ago. Diango, who was employed as a fisherman by a family residing at Oyster Bay, a small coast settlement, developed leprosy four or five years later and went to reside up the mountain. A year or so after his departure one of the sons of his employer, who used to fish with him in the same boat, became affected with the disease and from this one and only source of contagion the disease gradually made its appearance in other families, all residents of Oyster Bay. Dr. Mangenie is aware of 23 cases of leprosy, 16 of which are the descendants, directly or through marriage, of the first family affected with the disease. The other 7 cases are scattered over the island and these sufferers

are the descendants of Diango. During the last seven years four or five deaths due to leprosy have been registered and about nine new cases have come to light. Dr. Mangenie suggests that a scheme for proper and strict isolation should be put in force.

Straits Settlements.—The estimated population of the colony in 1918 was 827,719. The birth-rate decreased from 30·7 in 1917 to 28·6 per 1000 in 1918. The death-rate, on the other hand, increased from 37·0 per 1000 in 1917 to 43·9 in 1918. The principal causes of death in the latter year were malaria (4783 cases), infantile mortality (6009), influenza (3500), tuberculosis (2536), beri-beri (1961), and dysentery (1362). Dangerous infectious diseases notified in the colony during the year caused 55 deaths from small-pox, 68 from cholera, and 204 from plague, the corresponding figures in 1917 having been 176, 9, and 44. An outbreak of beri-beri in the prisons was traced to prisoners having been fed on rice steamed under pressure. After the cause had been ascertained and rectified there were practically no fresh cases.

Leeward Islands.—In his report on the Blue-book Mr. F. H. Watkins, acting Colonial Secretary, states that in Antigua the estimated population on Dec. 31st, 1918, was 31,179. The births registered in 1918 numbered 1169, being 37·5 per 1000. The legitimate births were 295 and the illegitimate 874. The death-rate was 31·6 per 1000. The deaths of children under 1 year, exclusive of stillbirths, were 20·3 per cent. of the total. In the Presidency of St. Kitts-Nevis the estimated population at the close of 1918 was 27,047 in St. Kitts, 12,254 in Nevis, and 4878 in Anguilla. The birth-rates were in St. Kitts 34·6 per 1000, in Nevis 38·1, and in Anguilla 33·2, whilst the death-rates were—St. Kitts, 28·7 per 1000, Nevis 25·0, and Anguilla 17·7. The mortality of infants under 1 year of age was 300, 284, and 133 per 1000 of the total death-rate in St. Kitts, Nevis, and Anguilla respectively. In Dominica the estimated population was 40,270; the birth-rate was 36·7 per 1000 and the death-rate 28·0. The illegitimate births were in excess of the legitimate. Montserrat had a population in 1918 of 11,264; the birth-rate was 35·9 and the death-rate 19·1 per 1000. The general health of the colony was satisfactory, but, the report adds, "No great advance will be made in health and sanitary conditions until the people as a whole are brought to realise the importance of cleanliness in elementary habits, and of ventilation and a well-regulated diet, especially for infants."

BRISTOL HOSPITAL SUNDAY FUND.

THE Lord Mayor of Bristol has collected this year a total of £6028 6*s.* 9*d.*, and has thus exceeded all previous collections by more than £900. Approximately half the money came from places of worship, and the remainder from schools, athletic clubs, and various sources. The fund is gradually assuming a place of importance among the various sources of hospital income, though at present it covers only a small fraction of the hospital expenditure of the city.

RHEUMATISM AND STAMMERING.

IN a recent report submitted to the Education Committee of the London County Council on the classes for the remedial treatment of stammering children, established in January, 1920, it was noted that boy stammerers outnumber girl stammerers in at least the proportion of 3 to 1. In a class held at Brixton the medical officer pointed out that of 7 children in whom the stammering developed after the age of six, 6 were cured. Two of these cases were ascribed to fright, 2 were imitative cases, and 2 came on after rheumatic fever. The common association of rheumatic fever with another disease of coördination in childhood—namely, chorea—is of course well established.

FUNCTIONAL RE-EDUCATION IN AMERICA.

DURING December, 1917, and the first half of 1918, Dr. W. Seaman Bainbridge visited Europe on behalf of the U.S. Navy Department, and subsequently his Report on Medical and Surgical Developments of the War was issued as a special number of the *United States Naval Medical Bulletin* (Washington, Government Printing Office). Dr. Bainbridge used his eyes well, and, in addition to his own vivid descriptions of his visits in England and on the continent, has included in his report brief summaries of the surgical lessons of the war from such authorities as Mr. H. S. Souttar and Professor (then Colonel) Gosset. The section on vocational training, abundantly illustrated with pictures taken in France, Belgium, and England, is perhaps of the greatest interest at the present time. Dr. Bainbridge emphasises the need of propaganda work to bring home to the general public their responsibility in caring for the permanent welfare of war cripples. He mentions that four cinema reels have been prepared to this end by the American Red Cross. To M. Edouard Herriot, the Mayor of Lyons, is given the credit for placing France at the head of European countries in first recognising officially the work of vocational re-education. The centre at the Grand Palais in Paris is noted as a model for American centres. The fine Department of Physiotherapy which has grown up since this report was written, under the care of Commander Bainbridge himself at the Brooklyn Naval Hospital, no doubt owes much to the inspiration of the earlier French work. The author believes that functional re-education should not wait for wounds to heal nor vocational training until function is completely restored. He urges that if schools must be under military discipline the latter should as far as possible be camouflaged, adding, "for the men are sick of military routine and resent control." The centres should be made home-like and attractive.

A HYGIENIC TRUSS PAD COVER.

THE R. H. Heward Company, of Twickenham, has sent us a sample of a moulded rubber truss pad cover, which is certainly conducive to cleanliness and comfort. It fits snugly over the pad and is fastened by a stud button.

HINTS TO MEDICAL WRITERS.

THE New York State *Journal of Medicine* suggests rules to writers which, if carried out, would materially lighten the task and, incidentally, brighten the life of the medical editor. When the subject is selected (so the admonition runs) write or dictate everything that may be in the mind or that may occur as pertinent to it. Then do three things: First, select a definite title or a clear definite text. Write it in clear large words; set it up before you on your desk; take your paper, a good blue pencil, and mercilessly cut out everything that does not conform with the text. Ability to "follow the text" is one of the highest attributes of the human mind. Second, go over the various paragraphs that remain and arrange them in logical order. Third, go over what is then left and study each important word and select synonyms that will best express the thought in your mind.

The admonition is reminiscent of the advice received in our youth, to think before saying anything whether it was true, kind, and useful. The application of either rule would considerably reduce output.

Communications, Letters, &c., to the Editor have been received from—

A.—Argus South African Newspapers, Lond.; Australia, High Commissioner for, Lond.
B.—Dr. W. C. Bosanquet, Lond.; Sir J. Byers, Belfast; Prof. A. E. Boycott, Branscombe; Sir J. R. Bradford, Lond.; Dr. G. Blacker, Lond.; Dr. C. Banks, Guernsey.
C.—Mr. W. T. Cranfield, Lond.; Dr. J. Cowan, Glasgow; Mr. H. Curtis, Lond.; Chicago School of Sanitary Instruction; Dr. J. T. Clarke, Kedah; Colonial Office, Lond.; Messrs. G. W. Carnrick Co., New York; Sir F. Colyer, Lond.; Mr. P. P. Cole, Lond.; Mrs. A. E. Cockerill Ilfracombe; Colonies, Under-Secretary of State for the.
D.—Dr. V. Dickinson, Lond.; Dr. J. W. Dalgleish, Sutton.
E.—Mr. D. L. Eadie, Edinburgh; Dr. A. Erdös, Oradea Mare; Mr. H. S. Elsworthy, Ebbw Vale; Epsom College, Lond., Sec. of.
F.—Dr. J. G. Forbes, Lond.; Dr. C. Flandin, Paris; Factories, Chief Inspector of, Lond.; Food Education Society, Lond., Hon. Sec. of.
G.—Genatosan, Lond.; Dr. S. R. Gloyne, Lond.; Dr. L. H. Guest, Lond.; Great Northern Central Hospital, Lond.
H.—Dr. C. T. W. Hirsch, Lond.; Mr. W. Howell, Lond.; Hôpital Français de Manchester, Hon. Sec. of; Mr. A. Hay, Aberdeen; Mr. R. R. Hyde, Lond.
I.—Imperial War Relief Fund, Lond.
J.—Johnson Society, Lichfield.
K.—Dr. W. N. W. Kennedy, Croydon.
L.—Dr. C. Lillingston, Gorleston; Dr. J. C. G. Ledingham, Lond.; Messrs. Lloyd and Bradham, Lond.; Miss G. M. E. Leigh, Edgbaston.
M.—Dr. K. M. McKeown, Belfast; Dr. E. D. Macnamara, Lond.; *Modern Medicine*, Chicago; Mr. J. S. Milne, Newcastle-on-Tyne; Dr. J. E. R. McDonagh, Lond.; Ministry of Health, Lond.; Mr. R. F. Moore, Lond.; Dr. A. McDonald, Washington.
N.—National League for Health, Maternity, and Child Welfare, Lond.; National Institute for Medical Research, Lond.; New York State Dept. of Health, Albany; National Hospital for the Paralysed and Epileptic, Lond.
P.—Dr. A. L. Punch, Lond.; Dr. J. Parkinson, Lond.
R.—Dr. J. D. Rolleston, Lond.; Dr. A. Rutherford, Edinburgh; Royal Mail Steam Packet Co., Lond.; Royal Faculty of Physicians and Surgeons, Glasgow.
S.—Dr. W. R. Smith, Adelaide; St. Bartholomew's Old Students' Dinner, Lond., Hon. Sec. of; Scientific and Industrial Research Dept., Lond.; Prof. W. Stirling, Manchester; Society for the Prevention and Cure of Consumption in the County of Durham, Sunderland; Dr. N. Samaja, Bologna; Dr. A. W. Stott, Lond.; Mr. F. B. Shawe, Swindon.
T.—Mr. W. J. Tennant, Lond.; Dr. S. R. Tattersall, Lytham.
U.—University College, Lond., Provost of.
W.—Dr. F. P. Weber, Lond.; Dr. G. Ward, Sevenoaks; Dr. E. Wordley, Lond.; Dr. H. A. B. Whitelocke, Oxford; West London Post-Graduate College, Sec. of; Miss M. C. D. Walters, Lond.; Dr. J. H. Woodroffe, Lond.; Sir C. Wallace, Lond.; Mr. H. J. Watt, St. Andrews; Dr. J. P. Walker, Ryde; Dr. L. D. Weatherley, Bournemouth; Dr. C. M. Wilson, Lond.

Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Some Clinical Points
CONNECTED WITH
GALL-STONES.

A Post-Graduate Lecture delivered at the University of Sheffield

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LADIES AND GENTLEMEN,—Cholelithiasis is very common. Its treatment is, at present, entirely surgical and outside the province of clinical medicine. I shall therefore confine my remarks to some of the problems connected with diagnosis, ætiology, and prognosis, which are constantly presenting themselves to every practitioner of medicine.

It is instructive to consider how greatly the diagnosis of gall-stones has been facilitated during the last 30 years. This we owe almost entirely to abdominal surgery.

For example, I was recently asked to see a married woman of 50, who gave a typical history of biliary colic for 23 years. When I saw her it was obvious that she was suffering also from malignant disease and had a hard gland behind the left sterno-clavicular articulation. Her husband did not believe my diagnosis, as he had been told exactly the same thing 23 years before by another consultant when his wife first began to have her pain. As this consultant was still in practice it was suggested that he should be called in again and asked to bring his old notes with him. This he did and read out to us a description which nowadays would suggest a typical attack of biliary colic. Yet 23 years ago the question of gall-stones was put aside in favour of malignant disease. The patient died a few weeks later of abdominal carcinoma.

The fact is that the gall-stone complex, as we know it now, was not at that time common knowledge.

JAUNDICE NOT AN ESSENTIAL SYMPTOM.

In considering the symptoms due to gall-stones the first point I would lay stress upon is that jaundice is not, as is often supposed, an essential symptom. The anatomy of the gall-bladder and bile-ducts shows that since the gall-bladder is a cul-de-sac branching off by the cystic duct from the main bile channel, there is no obvious reason why obstruction of this bile channel and consequent jaundice should occur so long as the stones remain in the gall-bladder. It is when they get out into the common bile-duct or when some catarrhal changes arise which block this channel that obstruction takes place. When present, however, jaundice is a valuable confirmation of the diagnosis.

Another point to remember about jaundice is that it is often so slight and so transient as not to be recognised even when it does occur. A full and complete yellowness of the conjunctiva and skin, known in the north of England as the "yellow jaundice," requires a certain intensity and completeness, and consequently a certain duration of obstruction. If a stone is expelled from the gall-bladder, slips back, or, being small, passes fairly quickly—say, in two or three hours—down the whole length of the common duct and out into the bowel, the obstruction to the bile flow which it produces during its passage may be insufficient to cause a recognisable deposition of bile pigment in the tissues. Inquiry, however, may show that after such an attack of pain the urine is rather highly coloured, and the patient is said to have been slightly sallow or a bad colour. These are points which should be carefully inquired into. It is also not uncommon to find a history of jaundice preceding the date of onset of pain by some years (see Postscript).

ABDOMINAL PAIN OR DISCOMFORT.

Of all symptoms abdominal pain or discomfort is the most common and the most important. Its position must first be considered. That it is usually and principally in the right upper abdomen goes without saying, and that it is by no means always limited to that region is familiar to all. Its most common direction of spread is round the body to the right and up towards the right shoulder, but it may vary in many ways. Sometimes it is quite misleading in its situation.

Thus, a man, aged 36, whom I saw in January, 1917, gave the following history. For four years he had pain between the shoulders, which was worse on waking and relieved by getting up. For one and a half years it had been more severe round the waist, worse on walking about. In the last attack it "left the stomach and went to the shoulders and down the arms." If he put his foot on anything rough on the ground whilst in the dark it doubled him up. When I heard his statement I must admit that the question of gall-stones did not occur to me. However, the condition was diagnosed later by one of my surgical colleagues and its presence confirmed by his subsequent operation.

Such a history emphasises the wide variations in area of pain which may exist.

As to the character of the pain, there is often much valuable information to be learned. In spite of the best intention on the part of the patient, it is quite extraordinarily difficult at times to get a true picture from his statements. The proper perspective can best be got by letting the patient talk on, often at somewhat wearying length. Some chance remark by the patient or by a friend who has been present during an attack often does more in confirming the diagnosis of gall-stones than any number of direct questions. This is really a form of psychoanalysis, and thus necessarily somewhat tedious and lengthy. If there is real colic of a typical kind the difficulty is slight. If, however, it is of less severity, and especially if the patient is of the uncommunicative type so common in the north, the difficulties may be great.

A case I saw quite recently will illustrate the kind of difficulty I mean. The patient, Mrs. X, was a stout pallid married woman of about 58. The history as given to me was as follows: She had suffered from "nervous dyspepsia" for ten years off and on. Two years ago she began to be worse with some constipation. She had pain after food, which increased by taking meat, and persisted for eight or nine hours after the meal. In December, 1919, she had pain irrespective of food. It would begin about 3 P.M. and last till 6 or 7 o'clock. Hot water or a little brandy relieved it, and also artificially induced vomiting. An examination of the abdomen at that time gave no tenderness and nothing abnormal was to be felt. The site of pain was vaguely referred to the upper abdomen. She was taken into a nursing home for further investigation, but nothing definite was made out. A test breakfast showed a rather large return, with much undigested solid; no reaction to Congo-red or tropæolin. No occult blood in fæces. An opaque meal showed nothing abnormal.

At that time there was nothing elicited which pointed directly to gall-stones. I did not see her again for six weeks, during which time the pain had not been severe, until ten days before my visit, when after two simple enemata she became collapsed and her doctor thought she would die. On this visit she told us, for the first time, that she had jaundice 12 years previously and that the doctor who then saw her said it was probably gall-stones. Further inquiry showed that the attacks of pain often came on quite suddenly, when she was feeling otherwise well, that they reached a maximum soon and passed off in two or three hours, and that after an attack she was often sallow and the urine rather dark. Examination elicited distinct tenderness over the gall-bladder region. Operation was performed by a surgeon a few days later and gall-stones were removed.

The points that I should lay stress upon as regards the character of the pain are: (1) Rather sudden onset, unexpectedly at any time of night or day; (2) rapid increase to acute severity; (3) duration of a few hours; (4) sudden decline in acute severity with more gradual decline of soreness; (5) tendency to follow unusual activity; (6) occasional but not constant relation to food. This kind of attack occurring in the night is not at all uncommon. My colleague Dr. A. E. Barnes, in discussing the diagnosis of duodenal ulcer at the Sheffield Medico-Chirurgical Society last session, laid down as an important axiom that "any abdominal pain which comes on spontaneously in the night should arouse suspicion of organic disease." I agree fully with that, and in my experience it is by no means uncommon in gall-stones. I also have records of cases in which attacks have been started by the jolting of long railway or motor journeys.

Complete freedom from pain in the intervals between acute attacks is always suggestive. In many cases, however, chronic discomfort—usually called indigestion—fills up most of the intervals. Tenderness over the gall-bladder region is usually found on careful examination. It is especially marked at or about the occurrence of an attack of colic, and may be constant.

THE PATIENT'S AGE AT ONSET.

In older text-books of pathology considerable stress is laid upon the frequency with which gall-stones were found at autopsy in elderly persons who had died of other diseases, and it was assumed that these had produced no symptoms during life. Such an assumption is, I think, not warranted. From what we now know of the varied symptoms which gall-stones may produce, it seems much more likely that in most, if not all, these cases symptoms of more or less severity did occur from time to time, but that as they were probably of a dyspeptic type their true cause was not suspected. Whether a person can have gall-stones for any length of time without any symptoms at all is doubtful.[1] It does not seem impossible; for we know that they may remain latent for long periods—ten years or even more. In every case, therefore, the question naturally presents itself as to how long have the stones been there? If they can remain latent for ten years there is no a priori reason why they should not do so for 20 or 30 or even more years. I raise this point because I am inclined to think that we are too apt to look upon gall-stones as a disease limited to middle life or later. This is certainly the teaching of our standard text-books, and appears to be the general impression. This view was chiefly obtained from statistics of autopsies at a time before operations for gall-stones were common, and deserves reconsideration in the light of more recent knowledge. The question is one of some importance because it leads sometimes to the wrong diagnosis of severe cases of biliary colic in young people, largely because of the youth of the subject. This particularly applies to persons between 15 and 30 years of age. At any age younger than 15 one must admit that gall-stones are very rare. Still,[2] in 1899, was able to collect only 20 cases in children under 14 years of age. Of these, 12 were in infants under 3 months; of the remaining 8 only 2 are recorded as having had colic. In 3, stones were passed per rectum, in 4 they were found post mortem. When, however, early youth and early adult life are reached my own experience makes me think that the condition must be more common than is generally supposed, and that it leads to mistaken diagnosis.

The following cases illustrate this point:—

CASE 1.—In 1905 I was called to see a single woman (C), 22 years of age, who was said to be suffering from floating kidney with Dietl's crises. There was a history of a bicycle accident several years ago, which was said to have started the trouble, and a fall from a horse in 1904, which had made it worse. She had a large loose kidney on the right side which was tender to touch. Acute attacks of pain kept recurring without vomiting or jaundice, but accompanied by flatulent distension. The diagnosis of floating kidney seemed correct at that time, and suitable means for supporting the kidney were adopted.

I did not see her again until 1913. The attacks of what was now called "indigestion pain," but was obviously her original trouble, had kept coming on at intervals and latterly getting more severe. Inquiry showed that the pain always began to the right of the epigastrium and went up to the right shoulder and back. One night her sister found her "curled up" with pain on the bedroom floor. When I saw her she was just getting over an attack, and there was great tenderness on the slightest palpation of the gall-bladder area. The kidney could still be felt and was sensitive to pressure, but relatively to the other tenderness this was negligible. Gall-stones were diagnosed and at operation several were found—one large one impacted in the cystic duct.

In this case, then, gall-stone colic had been overlooked and called "floating kidney" for over ten years. It is probable that the stones were present before she was 20.

CASE 2.—This was a single woman (E.), 25 years of age. I was asked to see her in July, 1911, when she gave the following history. Eight years before she had an attack of what was called catarrhal jaundice—that is to say, when 17 years old. Three years ago she had her first attack of abdominal pain. This pain was in the gall-bladder region and usually came on in the night. She was found to have a movable kidney on the right, which was diagnosed as the cause of her pain. From that time to the present much time and money had been spent on various kinds of "kidney belt," and many weeks had been spent in bed with the feet raised. For the last four weeks the attacks had been so frequent that she has had to be largely under morphia. There were many circumstances in this case which pointed strongly to gall-stones. She told us that the attacks used to come on absolutely suddenly and go off with equal abruptness. Again, they more than once followed the jolting of a motor-car drive, also there was the frequent occurrence at night in bed. It was suggested that the motions should be put through a muslin sieve for the next few days, and on the first trial a small, broken-up gall-stone was found.

[1] See Postscript.

[2] Still, G. F.: Transactions of Pathological Society, London, 1899, 1., 154.

Operation a few days later confirmed the diagnosis and removed the trouble permanently.

CASE 3.—A third case was seen in 1906 in a young woman (R.) aged 21 years. She was an ardent golfer and had suffered from recurrent attacks of abdominal pain for some years. For the last two and a half years these had become much worse; a swelling, thought to be the right kidney, was quite palpable below the umbilicus. The attacks were very acute, there was occasional vomiting, no jaundice, no fever. When I saw her she had just gone through a severe attack with much vomiting, during which tetany had occurred in the hands and feet on the second and third days. Food always made the pain worse. Between the attacks she was quite well. Laparotomy disclosed a large distended gall-bladder and gall-stones.

From the history it would seem that they had begun to give trouble when she was not more than 16; how much earlier they had been forming it is impossible to say.

SOURCES OF ERROR IN DIAGNOSIS.

In each of these cases the error was made of attributing the trouble to a "loose kidney," which was definitely present in two and absent in the third. Had these patients been women of 45 or thereabouts the diagnosis would probably have been made much sooner. It has been suggested that "floating kidney" with Dietl's crises may be a predisposing cause of gall-stones. My personal experience makes me suspect that many cases of "Dietl's crises" are cases of gall-stone colic from the first, in which the floating kidney is merely an accidental association.

In the next case no such difficulty as regards the kidney arose, but another factor—namely, hysteria—was allowed to interfere.

CASE 4.—The patient was a single woman of 25, of very hysterical type, with some vague history of sexual trouble earlier in life. She was admitted to the Sheffield Royal Hospital under my care in 1915, complaining of attacks of abdominal pain which had begun 15 months earlier. Hysterectomy had been performed a few weeks before the onset of this pain, but there was no definite information as to the reason for this. She was under observation in hospital for a month, and during that time had an attack which lasted several hours. In spite of the very obvious character of the pain a correct diagnosis was not made, and she was labelled "gastric neurosis." After returning home the attacks continued, and in January, 1917, I saw her again and suspected gall-stones. However, she did not feel satisfied and arranged to go into a well-known hospital in London. She was under the charge of one of the physicians there and seen in consultation by his surgical colleague, and they arrived at the conclusion that there was no evidence of gall-stones, but that the whole thing was a neurosis and operation inadvisable.

In October, 1917, I was asked to see her again whilst she was actually in an attack. There was then no doubt that she was suffering from biliary colic. In this case also the pain often came on in the night. Operation was performed and a large gall-stone was removed.

The exact notes taken by my clinical clerk on this girl's case in 1915 are as follows:—"The pain is of an aching character and starts under rib 7, right side, and gradually spreads round body in form of girdle pains, but always worst at the above region where it started: does not radiate to lower abdomen, but shoots up back to neck and head."

The description is so typical as to make the mistake in diagnosis almost incredible. It is accounted for by the fact that one is apt to forget that gall-stones do occur in young people, and secondly, that a highly neurotic person always runs the risk of organic mischief being overlooked. This is a point worth bearing in mind. The boy in the fable who called out, "Wolf! wolf!" was an undoubted hysteric. When the wolf actually did come, he suffered the fate which hysterical people often suffer in the clinical world: nobody believed him! The desire for notoriety and sympathy which filled his youthful hysterical mind has in his case been posthumously fulfilled. The next four cases are merely added to emphasise the point as to age.

CASE 5.—In 1909 I saw a typical case in a girl of 17 years. The attacks were characterised by intense pain over the gall-bladder, coming on absolutely suddenly at any time and passing off with equal suddenness in four to five hours. In the interval she was perfectly well. At operation about 20 very small stones were found. Possibly each attack represented the actual passage of a stone from the gall-bladder to the duodenum which occupied the above-mentioned time, and was too brief to cause jaundice. Probably the simple process of passing the motions through a sieve would have demonstrated the stones.

CASE 6.—In 1914 a single woman (C.), age 28, was admitted to the Royal Hospital suffering from abdominal pain. Her symptoms began when she was 15. The pain followed food at intervals varying from a quarter to one hour. An attack lasts from two to two and a half hours. She goes yellow after an attack. For the last 18 months they have been getting worse. Attacks may come on in the night. Her mother had similar attacks. The gall-bladder is palpable. At operation 351 small stones were removed from the gall-bladder. Assuming that the onset of symptoms corresponded with the first formation of stones, she had been laying down stones at the rate of about 45 per annum, or nearly one a week.

CASE 7.—A married woman (G.), aged 24, began to have attacks of biliary colic with jaundice after a confinement one year ago. At operation four small dark-brown masses were found in the gall-bladder.

CASE 8.—Married woman (V.), aged 29, had her first attack of colic five years previously. Frequent recurrence; has had many attacks in night. Operation; a large number of stones removed.

I have also gone into the question of age of onset from another point of view—namely, in connexion with the histories given by those suffering from gall-stones in later life; and it is surprising how often it is possible to get a history of vague but real abdominal discomfort dating from comparatively early adult life. The patients may tell you that the type of pain has changed, and the much more striking colic may only have begun years after the chronic so-called stomach trouble. In 30 of my cases in which the presence of gall-stones was demonstrated at operation the date of first onset of symptoms is carefully recorded as follows:—

Symptoms of gall-stones began under 20 years of age ...		4	11
,, ,, between 20 and 25	,, ,, ...	4	
,, ,, ,, 25 ,, 35	,, ,, ...	3	
,, ,, ,, 35 ,, 40	,, ,, ...	7	
,, ,, above 40	,, ,, ...	12	

The number of cases may seem insignificant, but they are the only ones in which the records, on this point of date of onset, are complete and the results of operation known. As regards age of onset, these figures give numbers which, if exceptional and accidental, at any rate show that gall-stones beginning in the period of life, 15 to 30, are by no means rare in these parts.

The Dangers of Declining Operation.

It is usual at the present time to advise operation in most cases of gall-stones. Although in many cases this advice is followed, usually with the happiest results, it is not uncommon to meet with patients who cannot make up their minds to undergo the ordeal of an operation. Thus, an active vigorous man, 70 years of age, whom I saw recently, was seized with a typical severe attack of biliary colic. He had had a similar attack 15 years before, for which morphia was required, and a slighter attack, which passed off in a few hours, one year ago. He declined operation absolutely and, to a certain extent I think logically, for he said: "I have managed to carry on for 15 years without a second severe attack. Why shouldn't I go for another 15 years without one?" I have quoted this case merely as an example of what is familiar to every medical man, and I want to consider how far this patient or any other similarly affected is wise or foolish in declining operation.

What becomes of patients who know they have gall-stones and elect to keep them? They escape thereby the discomfort and the dangers inherent to every major operation. What are the discomforts and dangers to which they expose themselves?

These may be summarised under three heads: (I.) Persistence or recurrence of pain. (II.) Inflammatory complications, leading to adhesions, ulceration, gangrene, &c., necessitating an operation of urgency under conditions of considerable gravity. (III.) The occurrence of cancer in the gall-bladder region. There is also the possibility of chronic pancreatitis with its usual train of symptoms. In order to obtain some data on these points I have gone carefully through my records of cases and followed up, so far as has been possible, those patients in whom the diagnosis seemed quite clear and who declined operation. In a few of the cases stones had been passed by the bowel; in all but three jaundice had occurred, often more than once. In all the history was typical. The actual number of cases which comply with these requirements is necessarily small, as in so many there is an element of doubt. I have been able to follow up the after-histories of 26 such cases during varying periods from 20 years downwards to two years. There were 9 males, 17 females.

The first of the three questions summarised above amounts to whether a person with gall-stones is likely to have increasing frequency of attacks of colic as age advances—that is, supposing no other complications arise. So far as my limited numbers go I am inclined to answer this in the negative. On general grounds one might expect that with the increasing calm of advancing age, and the absence of violent exercise, over-indulgence in food, and hurry, there would be less disturbance in the gall-bladder and fewer attacks.

AFTER-HISTORY OF CASES NOT OPERATED ON.

One case (Mrs. J.) had colic at the ages of 52, 58, 61, 62, and 64; she then had no further attack in her life and died of some unconnected disease at 72. So that for the last 12 years of her life she was free from attacks. A man (D. W.) had an attack when 68 and lived another 10 years without any further trouble and died suddenly. A woman (Mrs. T.) had colic attacks from the age of 61 to 64; she lived to 69, having no further attacks and dying of cerebral hæmorrhage. A man (Mr. L.) had colic during his fortieth and forty-first years he is still living at 48, and has had no further attacks.

A woman (Mrs. P.) had colic and passed a stone per rectum at 45 years of age; she has had no attack since—that is, 10 years later—and is in good health.

Woman (Mrs. J.) had recurrent attacks from 38 to 56 years of age. She is now 67 and has had no attacks for 11 years.

These are not many cases on which to dogmatise, but there is another side on which we have indirect confirmatory evidence. As was said above, in a considerable percentage of autopsies gall-stones are found in persons who have died of something quite distinct. In many of these there is no history of previous illness pointing to their existence. This may mean that they have never caused any trouble at any time, but more probably it means that during the later years of life they have not done so, and since the short memory of hospital patients is well known the symptoms of earlier years have been forgotten. Although the data thus obtained is scanty, I think we may say that it is not usual for gall-stone colic per se to get progressively worse in declining years.

The second danger to which the gall-stone owner is liable is inflammatory complications and ulceration. The relative frequency of these must be comparatively small and therefore the likelihood of their occurrence in any individual case not very great. There is, of course, a risk, and when it occurs, a very serious danger. Unfortunately it is very difficult in any case of gall-stones to know, until operation, whether one is dealing with a simple uncomplicated case or with a condition of affairs which may at any moment become dangerous. The case of Mrs. X. proved to be one of this kind. There was nothing in the history to make one suspect the severe and complicated condition found by the surgeon at operation. As a matter of fact, I am informed that she had, in addition to stones in the gall-bladder, one stone loosely impacted in the common duct, the gall-bladder was adherent to the liver and to the duodenum, and ulceration had taken place between gall-bladder and duodenum.

With such a condition as this, in what seemed a straightforward case, one can never feel safe in supporting the plea of no operation, however simple the case may seem. The patient is always running the risk of urgent danger.

CARCINOMA IN PATIENTS WITH GALL-STONES.

Lastly, there is the question of carcinoma. My inquiries show that of the 26 cases followed up 13 are still living, 8 have died of malignant disease of the abdomen, and 5 from other causes. Thus of these 26, no less than 8 have already died of abdominal carcinoma. How many of these were actually primary in the gall-bladder I cannot say, as autopsies were not obtainable, but some certainly were strongly suggestive of this.

It is useless to quote percentages in dealing with small numbers like this, but it shows, at any rate, that the possibility of a terminal carcinoma in cases not operated upon is considerable and real. This is, of course, a well-known fact. Rolleston, in his "Diseases of the Liver, Gall-bladder, and Bile-ducts," goes into the question very fully, and gives interesting statistics on the subject. These vary very widely from 4 per cent. to 14 per cent.

It is worth while, however, looking into the details of my cases as to when this occurred.

1	died at	68	after having had colic for		30	years.
1	,,	67	,,	,,	13	,,
2	,,	65	,,	,,	20	,,
1	,,	50	,,	,,	25	,,
1	,,	63	,,	,,	11	,,
1	,,	59	,,	,,	12	,,
1	,,	65	,,	,,	8	,,

On an average these patients had suffered from colic for 17½ years before malignant disease supervened,

and their average age at death was nearly 63. Fütterer[8] gives the average age of primary carcinoma of the gall-bladder in a large series of cases as 58 years, and Winton in a series of 60 cases agrees with this. One cannot, therefore, say that the occurrence of carcinoma of the gall-bladder is likely to be an early result of gall-stones. In fact, it might be said that in such persons carcinoma comes on at about the same period of life as in other persons, but its place of selection seems to be the gall-bladder.

CONCLUSIONS.

As I said at first, cholelithiasis is very common, and it is almost certain that the number of cases in which this condition is the cause of vague abdominal pain is even greater than is generally realised. I feel sure that in doubtful cases we neglect too much the simple method of examining the fæces by straining them through muslin after an attack of abdominal pain. It is not very troublesome, and if, as so often happens, small stones are being passed, their detection in the fæces settles the matter at once. There is every likelihood that in some few cases all the stones in the gall-bladder are eventually passed in this way and complete recovery thus occurs without operation, but this is probably a rare method of cure. A few months ago I saw an instance of this in a woman who began with severe biliary colic when 25 years of age. This recurred every month or two for ten years. The pain was so intense that the doctor was always obliged to give her a few whiffs of chloroform to relieve her until he could get his syringe ready and the morphia injected. After each attack she strained the motions through a sieve and always found a small stone. I saw her collection of these, which filled a small bottle. She declined operation. From the age of 35 up to the present time—she is now 50—she has never had another attack or any discomfort of any kind, and I suppose she has passed them all. However, this is an exceptional experience and cannot be offered as a probable result in most cases.

I think, therefore, that it is our duty to urge all those in whom the existence of gall-stones is fairly certain to undergo operation, unless there is some strong contra-indication. Although their pain may be tolerable, and perhaps only intermittent, yet it is impossible to judge how far dangerous inflammatory complications already exist, or how soon they may arise, whilst the possibility of malignant disease ending the scene is a very real one, although this may be delayed for many years.

Postscript.—Since this lecture was delivered I have seen two cases bearing upon points emphasised in it. One of these was a man of over sixty years of age, who began with abdominal pain and jaundice. He was quite certain that he had never before suffered from abdominal pain or discomfort of any kind, and in this he was confirmed by his medical attendant. This complete absence of previous pain, together with the persistence of pain and jaundice at his age, made the diagnosis of malignant disease seem probable. He was eventually operated upon, and I am informed that a stone was found impacted in the common duct and nothing else. Unfortunately he only survived the operation a few weeks. It is, of course, impossible in such a case to form the least idea as to how long the stone had been in the gall-bladder absolutely quiescent. The second case was another example of gall-stones in a young woman. She was 32 and had suffered from attacks of colic for eight years, since she was 24. The interesting point was that she had suffered from an attack of jaundice at 11 years of age. Operation showed a large number of small stones.

[8] Rolleston: Diseases of Liver, &c., p. 641.

PORTSMOUTH WAR MEMORIAL: GIFT TO HOSPITAL.—At a meeting of the Portsmouth War Memorial Fund Committee held on Sept. 13th it was stated that the fund amounted to £21,100. It was decided to allot £10,000 to the Royal Portsmouth Hospital and to hold over the remainder for the erection of a suitable cenotaph, the cost of which was estimated at approximately the same figure. Any balance remaining is to be given to the hospital.

The Lumleian Lectures

ON THE

CLINICAL EXPERIENCES OF A PHYSICIAN DURING THE CAMPAIGN IN FRANCE AND FLANDERS, 1914-19.

Delivered before the Royal College of Physicians of London

BY SIR JOHN ROSE BRADFORD, K.C.M.G., C.B., M.D., F.R.S., F.R.C.P.

LECTURE III.*

MR. PRESIDENT, FELLOWS OF THE COLLEGE, AND GENTLEMEN,—In my previous lectures I have brought to your notice some of the diseases that were met with during the campaign, and discussed some of the clinical problems presented by these; to-day I propose to deal with some of the effects produced on the chest by gunshot wounds. Chest lesions are seen not only as a result of gunshot wounds of the chest, they may also occur as a result of gunshot wounds in other and even distant parts of the body. Gunshot wounds of the chest produce many effects that are of great interest from the medical side, and in this lecture I propose to deal mainly with but one side of the question—i.e., that dealing with certain physical signs that are frequently to be observed in such cases.

LESIONS RESULTING FROM WOUNDS OF THE CHEST.

Wounds of the chest are usually classified as either penetrating or non-penetrating, and one of the most striking facts observed is that the effects produced by these very different wounds are not uncommonly very similar, and hence it may sometimes be extremely difficult to determine with accuracy whether a given wound is a penetrating or a non-penetrating one. Gunshot wounds of the chest may give rise to a great variety of lesions, such as hæmothorax, sterile or infected, pneumothorax, open or closed, sterile or infected, pneumohæmothorax, pleurisy, empyema, hæmatoma of the lung, massive collapse of the lung, rupture of the diaphragm, lesions of the pericardium, or of the heart or great vessels, &c. Further, chest wounds may be single or multiple, but I propose in this lecture to limit my remarks in the main to the consideration of the effects of unilateral wounds in the production of the condition known as massive collapse of the lung, and only to deal with other lesions in so far as is necessary in order to elucidate massive collapse.

Unilateral wounds of the chest may give rise to either unilateral or bilateral lesions. When unilateral they may be on the side of the wound—i.e., homolateral—or else on the opposite side—i.e., contralateral. When an unilateral wound causes either unilateral or bilateral lesions, these may be direct and immediate or else indirect and remote, and therefore really of the nature of complications, and then they may occur either early in the history of the case, as in certain cases of contralateral massive collapse, or else at a later period, as in the case of bronchitis or pneumonia occurring as well-recognised complications in cases of hæmothorax, &c.

Chest lesions may also be seen as a result of gunshot wounds, not of the chest, but of other and, it may be, distant parts of the body, and here also they may be either of direct or indirect origin. Thus, a wound of the face, arm, or even of the buttock may give rise to a hæmothorax by the injury inflicted by the actual track of the missile. In this case the lesion is of direct origin, and if, as is sometimes the case in wounds of the face or arm, the wound of entry is small and there is no wound of exit, the nature of the case may be overlooked at first and the chest lesion attributed not to its real cause—hæmothorax—but to some other condition—e.g., pneumonia. These cases of chest injury as a direct result of wounds in distant parts of the body are of some clinical interest owing to their diagnostic difficulties and as illustrating the often remarkable course taken by missiles in the body, but they do not present the problems that arise in cases where the distant wound leads to the development of chest lesions in an indirect manner.

* Lectures I. and II. appeared in THE LANCET, Sept. 11th (p. 535), and Sept. 18th, (p. 583), respectively.

In these cases the injury inflicted by the missile is limited to the part struck—i.e., abdomen, buttock, thigh—the chest is uninjured, and yet as a direct result of the wound a chest condition of considerable importance—i.e., massive collapse—develops.

Finally, wounds of distant parts of the body may give rise to chest lesions as a result of the development of complications, such as pneumonia, pleurisy, &c. It is evident from these considerations that the subject of chest lesions in gunshot wounds is very complex, and it is not surprising that considerable difficulty may be experienced in the correct interpretation of the physical signs in any given case.

LESIONS PRODUCED BY UNILATERAL PERFORATING WOUNDS.

Sterile Hæmothorax.

The study, firstly, of some of the lesions produced by simple penetrating wounds limited to one side of the chest, so-called through-and-through or perforating wounds, and, in the second place, the study of the massive collapse that may ensue as a result of non-penetrating wounds of the chest wall, form the subject on which I wish to address you to-day. The simplest and at the same time the most common lesion produced by a unilateral through-and-through wound of the chest is a sterile hæmothorax of varying amount.

Inasmuch as this lesion produces mechanical or physical effects somewhat similar to those seen in pleural effusion, it might on a priori grounds be assumed that the clinical picture and physical signs of these two conditions would be very similar if not identical. In both the essential abnormal condition is the presence of a variable but often large amount of fluid in the pleural cavity, and hence it might be thought that the physical signs of a sterile hæmothorax would be more or less identical with those recognised by all as characteristic of pleural effusion.

Differential Diagnosis.

A very small clinical experience of cases of hæmothorax is sufficient to show that this is not the case and that in reality the physical signs of the two conditions are very dissimilar.

In pleural effusion the classical and typical physical signs are the bulging of the affected side with impaired mobility, displacement of the heart, lack of resonance on percussion over the area of the effusion with skodaic resonance above it, diminished tactile fremitus, and weakening or absence of breath sounds with, in some cases, tubular breathing limited in its position and possibly accompanied by increased bronchophony and ægophony. If the effusion be a left-sided one diminution of resonance over Traube's space is a well-recognised and common phenomenon. Bulging of the affected side of the chest, together with weakened or absent breath sounds, and displacement of the heart are nevertheless the usual and outstanding signs of this condition. It is true that such signs may sometimes be present in cases of hæmothorax, but they are not the usual ones, and in my opinion are not the typical signs of a sterile hæmothorax. In a simple sterile hæmothorax of moderate or even of large amount the signs are rather as follows: The affected side of the chest is immobile and retracted to a greater or less degree, and notwithstanding the existence of this retraction the heart is displaced in a manner similar to that seen in pleural effusion—i.e., away from the retracted and affected side and towards the normal side. Well-marked retraction may be present when the hæmothorax is by no means small in amount—i.e., two to three pints. The retraction is not only obvious to the eye and capable of being measured by the cyrtometer, but is shown in another way—i.e., by the upward displacement of the diaphragm, which is a most constant and characteristic feature of cases of hæmothorax. This upward displacement of the diaphragm is readily detected on X ray examination, but in cases of left-sided hæmothorax it can also be determined by the increased area over which resonance can be elicited by percussion, and Traube's space instead of being diminished in area as determined by percussion is, on the contrary, greatly increased in the upward direction.

This criterion affords one of the most striking differences in the physical signs of the two conditions and in the earlier periods of the campaign was a common cause of errors of diagnosis. Further, the skodaic resonance in cases of hæmothorax is extremely well marked, and thus it may well be that in cases of quite considerable hæmothorax on the left side there may be little or no dullness on percussion over the chest anteriorly with the patient in the recumbent posture. X ray examination reveals not only the high position of the diaphragm but also shows that it is immobile. In other words, in hæmothorax the diaphragm and the chest wall behave in a similar fashion; they both assume a position diminishing the size of the pleural cavity on the injured side and they both become immobile.

Although this retraction of the thoracic parietes in hæmothorax is in such contrast to what usually obtains in pleural effusion, yet the displacement of the heart in the two conditions is similar; that is to say, the heart is displaced towards the healthy side, and therefore away from the retracted side. Whatever the mechanism is that leads to the retraction of the chest wall and to the upward displacement of the diaphragm it is one that does not cause the heart to be displaced towards the affected side. Further, if from any cause, a moderate hæmothorax with the usual signs described above undergoes a sudden increase, as may happen when infection rapidly involves a sterile hæmothorax, the heart may undergo a further displacement, and strange to say, the retraction of the chest wall on the affected side persist. If, however, the pleural exudate becomes quite large the retraction will disappear, and then the signs will closely resemble those of pleural effusion. The retraction of the chest wall is certainly not only a most constant but also a very remarkable feature of hæmothorax, and it is strange that space should be found for the pleural contents rather by displacement of the heart than by the bulging of the chest wall. The auscultatory physical signs of hæmothorax are also somewhat different to those commonly present in pleural effusion, in that tubular and even amphoric breathing are much more frequently heard, together with greatly increased bronchophony and extremely well-marked pectoriloquy. Such signs are frequent in hæmothorax and rather infrequent, although by no means unknown, in pleural effusion.

Finally, mention must be made of the fact that the retraction of the chest wall is sometimes much more marked locally, and more especially in the lower regions of the chest posteriorly.

It is, of course, understood that the above description refers to cases of simple hæmothorax produced by through-and-through perforating gunshot wounds, and where the actual injury to the chest wall is often exceedingly slight. The retraction of the chest wall is not dependent upon any smashing injury of the chest wall, nor is it associated with any painful condition of the parietes. It may be seen in cases where the wounds are so small as almost to escape observation.

Causation of Differential Physical Signs.

When we consider the above physical signs, and more especially the retraction, the absence of bulging of the chest wall, the well-marked tubular or amphoric breathing, and the presence of pectoriloquy, together with the presence of some pyrexia and bloody sputum, it is not surprising that the presence of hæmothorax was often overlooked and the diagnosis of so-called "traumatic pneumonia" made in its stead. It was difficult to realise that the above signs were really indicative of the presence of blood in the pleura and not of pulmonary consolidation.

Post-mortem examinations showed that inflammatory complications such as pneumonia practically did not occur in lung tissue collapsed under the pleural effusion present in hæmothorax, although such complications might occur as a result of wounds where no hæmothorax was present. In other words, the presence of hæmothorax in some way prevented the development of such inflammatory complications as pneumonia or bronchitis in the collapsed lung, although such complications might occur in other portions of the lung not collapsed by the hæmothorax, either on the same or on the opposite side. The results obtained by the study of these port-mortem findings and the clinical phenomena described above led to the conclusion that the physical signs produced by a sterile hæmothorax of simple production and of moderate amount—e.g., two to three pints—were in reality totally different to those found in an ordinary acute pleural effusion of similar size, and then the question naturally arose as to the reason for this difference. The presence of such marked retraction of the chest parietes and the high level of the diaphragm suggested the question whether the collapse of the lung found post mortem was really produced by the presence of the extravasated blood and fluid exudate in the pleural cavity, or whether it had some other origin. If the extravasated blood in hæmothorax solely produced the collapse of the lung it was not obvious why the signs should be different to those of pleural effusion; if the collapse had some other mode of origin it might perchance afford some explanation. A simple explanation that presented itself was that the gunshot wound led at once to collapse of the lung on the injured side by producing a pneumothorax that was only of transitory duration, and that the blood was extravasated after the lung had already collapsed. This seemed plausible and capable of accounting for the extensive collapse of the lung often found to be present. Such a view, however, was soon shown to be

untenable, as the same phenomena were found to occur in cases of non-penetrating wounds; and further, as will be seen later, it was also negatived by the occurrence of massive collapse of the contralateral type as a result of non-penetrating wounds of the chest wall.

Further clinical observation revealed, however, two types of cases that must be discussed in order to attempt to grasp the nature of the collapse of the lungs that results from gunshot wounds of the chest.

In the first type of case a unilateral penetrating wound causes the development of the following clinical picture. Physical signs are found on the injured side, such as immobility, dullness on percussion, absence of breath sounds, retraction over not only a very large area, but not uncommonly implicating the whole side, so that dullness is present up to the clavicle. In other words, the signs suggest at first that a very large effusion, filling the pleural cavity, is present, but more careful observation reveals that the displacement of the heart is either absent or else that it is somewhat misplaced towards the affected side, and that the patient, although presenting these extensive signs, is not always greatly distressed. If paracentesis be at once performed only a small quantity of fluid, it may be but a few ounces, is withdrawn. With or without paracentesis the signs clear up rapidly, sometimes in a few days, and cases have occurred where paracentesis had been ordered but postponed for some reason for 24 hours, and then when about to be done the signs had so altered that it was unnecessary. X ray examination, together with the results of paracentesis and of clinical observation, revealed that there were cases of quite small hæmothorax associated with extensive massive collapse of the lung quite out of proportion to the amount of fluid extravasated in the pleural cavity.

The results at this stage of the inquiry may be summarised by stating that it seemed that in simple penetrating wounds causing sterile hæmothorax the collapse of the lung was not directly and solely dependent upon the quantity of the extravasated blood and fluid in the injured pleural cavity. Cases were seen where the collapse involved the whole lung on the affected side and yet where paracentesis, X ray examination, and the clinical course of the case showed conclusively that a large extravasation was not present in the pleural cavity. These cases, however, present many difficulties in their interpretation, as it is obvious that a penetrating and perforating gunshot wound may give rise to many lesions of the lung that can only be surmised and not ascertained with certainty, and thus the interpretation of the massive collapse observed in such cases is open to question. For this reason we will now turn to the consideration of the second group of cases alluded to above—i.e., to the study of certain clinical phenomena the result of non-penetrating wounds of the chest.

CLINICAL PHENOMENA RESULTING FROM NON-PENETRATING WOUNDS OF THE CHEST.

Non-penetrating unilateral chest wounds may give rise to lesions of the thoracic contents either on the side injured (homolateral) or on the opposite side (contralateral). The homolateral lesions are essentially of the same character as those seen in penetrating wounds and will not be considered here as they also are often difficult of interpretation, inasmuch as it may in any given case be difficult to prove that the wound is not a penetrating one. The contralateral lesions are for our present purpose much more suitable as no such questions arise in these cases.

A non-penetrating wound of the chest wall of quite simple character, not producing any extensive local injury, may nevertheless produce a massive collapse involving the whole of the lung on the opposite and uninjured side. I wish, Mr. President, to emphasise the fact that such wounds are often very slight—i.e., certain wounds without the presence of any fracture of ribs and without the presence of any signs or symptoms pointing to damage of the thoracic contents on the side injured. Thus, such cases may not only show no physical signs of pleural or pulmonary lesions on the side injured, but they may never have suffered from hæmoptysis, a common symptom in non-penetrating chest wounds. In one of the most typical cases of massive collapse of this contralateral type that came under my observation the man walked four miles to the dressing station after being wounded, and the bullet dropped out when taking his tunic off. He had no hæmoptysis and no serious symptoms of any kind, yet massive collapse of the whole of the opposite lung was present within 24 hours of his being wounded.

Massive Collapse of the Lung.

These cases of massive collapse of the contralateral type, produced by non-penetrating wounds of the chest, are in many respects the most suitable variety for the clinical study of the condition since some of the ætiological factors usually regarded as necessary for its production are not present in such cases.

Thus the injury is not of necessity a severe one and the patient has not been compelled to assume a constrained posture, and sometimes, as just mentioned, has not even been in bed or lying down for a long period prior to the onset of the collapse. Further, there is no injury of any kind on the side of the collapsed lung, and nothing in the history to suggest obstruction of the bronchus by blood clot or foreign body; and it is difficult to see how such an obstruction could be present as a result of slight non-penetrating wounds of the opposite side of the chest. Lastly, but by no means of little importance, no anæsthetic had been administered to such patients prior to the onset of the massive collapse. It would seem evident, therefore, that these contralateral cases arise in some manner as a direct result of the injury to the chest wall. Although this variety of massive collapse is perhaps the one with the most striking clinical picture and the one where clinically there is the least difficulty in its recognition, there are many other forms of collapse after gunshot wounds. Thus it may be seen in a homolateral form after both penetrating and non-penetrating unilateral wounds, but in both of these there may be much more difficulty both in the diagnosis and in determining with any accuracy whether obstruction of the bronchus from a foreign body is present. Thus, in non-penetrating wounds bruising of the lung and the development of a hæmatoma of the lung are not uncommon. In penetrating wounds it is very difficult to determine clinically the part played in the production of collapse by the mere presence of fluid in the pleura. Although, as described above, massive collapse quite out of proportion to any fluid present can in some cases be diagnosed with accuracy and confirmed by X ray examination and by the clinical course of the case, yet this is only done with ease in cases of very complete and extensive collapse. In the more usual type of case it might seem far fetched in any given case to suggest that the collapse was excessive in amount and out of proportion to the quantity of fluid present in the pleura. It is for such reasons that in order to demonstrate with ease and certainty the presence of massive collapse the contralateral type following non-penetrating wounds of the chest wall should be selected.

Massive collapse is seen, however, under other conditions; it may occur not only as a direct result of gunshot wounds of the chest, but also indirectly as a complication. Thus it is by no means rare as a contralateral complication in cases of unilateral hæmothorax, although in such cases it is often overlooked or else diagnosed as pneumonia. Its occurrence as a complication of unilateral hæmothorax is one explanation of those cases where there is extreme displacement of the heart, suggesting the presence of a large collection of fluid in the pleura, and where paracentesis, &c., actually shows that the amount is small. In such cases the heart is displaced not by being pushed over by the pleural collection but owing to the existence of massive collapse on the side towards which the heart is displaced. This contralateral collapse occurring as a complication of hæmothorax is very readily confounded with contralateral pneumonia, since in collapse such signs as well-marked tubular breathing, pectoriloquy, râles, &c., are, if anything, better marked than in pneumonic consolidation. The distinguishing feature between the two conditions is the displacement of the heart, but in such cases as we are now discussing it is probable that the cardiac displacement will be attributed entirely to the hæmothorax, and thus the error of diagnosis made. It is probable that in certain rare instances massive collapse may occur as a complication of hæmothorax on the same side as the hæmothorax and involve the remaining free portion of the lung. I have seen a very few instances where from the signs and symptoms it was probable that this had occurred, but the diagnosis of such a condition and the separation of it from an increasing pleural effusion is a clinical problem of some difficulty, and I do not propose to dwell on this very rare group of cases.

There is, however, another group of cases of massive collapse of considerable interest where the condition is found in association with gunshot injuries of other, and it may be distant, parts of the body. Wounds of the abdomen may be followed by the development of massive collapse, and such cases resemble those described in civil practice by our Fellow, Dr. W. Pasteur.

In such cases the ætiology may be complex, just as it is in the cases of civil practice where the collapse develops after an operation for hernia or for appendicitis, and I do not propose to discuss them here. Wounds limited to the abdominal wall, and by no means of a severe character, may also lead to the development of massive collapse, and here also it may be on the side of the chest opposite to the abdominal wall wound.

Some of the most marked instances of massive collapse that I have seen occurred as a sequel to wounds of the buttocks, and in some cases of wounds of the thigh. In all these cases the wounds were of a severe type; in the case of the thigh, fracture of the thigh was always present; and in the case of the buttock wounds, although bone injury may not have been present, wounds were always of a severe type. In all these cases where buttock or thigh wounds were present the character and position of the wounds were such as to cause great distress to the patient, and they also caused great constraint of postures. This may well have played a part in the production of the lesion. No case of massive collapse of the lung came under my observation where the wound was one affecting either the upper limb or the head.

Physical Signs of Massive Collapse of the Lung.

The physical signs present in cases of massive collapse are very definite, although they vary necessarily with the extent of lung involved in different cases, and also with the degree to which any given area of lung involved is affected; hence they not only vary in different cases but also in one and the same case at different times—i.e., at different stages in its progress. It is probable that two, if not three, stages may be recognised, and for the reasons mentioned above the signs will be described in the simplest type of case—i.e., that of massive contralateral collapse in cases of non-perforating unilateral wounds of the chest wall.

In such a case the physical signs in the first stage are retraction and immobility of the side affected, high and immobile diaphragm on the affected side, and displacement of the heart towards the affected side. The displacement of the heart is extreme; thus, if the left side be the one affected the maximum impulse may be in the mid-axilla, or, if the lesion is on the right side, the impulse may be well felt in the right nipple line. When the collapse involves either the whole lung or the upper lobe the displacement of the heart, instead of being a purely lateral one, is oblique, so that the impulse is displaced upward as well as laterally. In left-sided cases of this type the impulse may be well felt and seen in the third left space or even behind the third rib. It is remarkable that these extreme displacements of the heart are, so far as my experience goes, unaccompanied by any murmur, either basal or apical.

All cases of massive collapse present the above physical signs and only vary in the degree of their development, but the other physical signs may vary according to the period in the development of the condition at which the patient is examined. If seen early, and where the collapse involves much lung and to a considerable degree, the percussion note will be impaired or dull, the tactile fremitus deficient or absent, and the breath sounds either very weak or inaudible.

These signs, together with the retraction and cardiac displacement, are characteristic of the first stage—i.e., in cases seen early and where there is extensive and marked collapse. It is of importance to recognise that in such cases the extreme displacement of the heart is the outstanding physical sign, and were it not for this the weakening of the breath sounds and the retraction of the side might either be overlooked or not attract the attention they deserve. Such cases are often difficult of interpretation if massive collapse, as a possible cause, is not present to the mind of the observer. This first or early stage may readily be overlooked, as frequently such patients have no severe symptoms, and unless the position of the impulse is noted the existence of the collapse is not recognised.

In the second stage the physical signs are more obvious, and the bulk of cases seen come under observation at this stage, when the heart is still extremely displaced, the chest retracted, the diaphragm high, but the breath sounds, instead of being weak or absent, are tubular or amphoric in quality, and tactile fremitus is increased and pectoriloquy extraordinarily well marked. The loud character of the tubular or amphoric breathing, together with the presence of whispering pectoriloquy, causes such signs to be frequently interpreted as pneumonic in origin. In these cases the retraction of the chest wall, although present, may not be so marked as in the first stage, and similarly the immobility of the chest may be also relative rather than absolute.

In the third stage of massive collapse the displacement of the heart is less, as the heart is returning to its normal position numerous râles and crepitations may be audible over the pulmonary area where tubular breathing, but less marked, is still audible. It is of some interest that an area of tubular breathing may persist for some days after the heart has returned to its normal position.

Such, then, are the signs of massive collapse, and the extent of their development in any given case will depend on the area of lung involved and the stage at which the patient is first seen. Massive collapse may involve the whole of one lung or the whole of one lobe or only a portion of a lobe. When it is lobar the lower lobe is the one most usually involved, but some cases of collapse limited to the upper lobe have been observed. Collapse involving the entire lung on one side has only been observed by me as a sequel of non-penetrating wounds of the chest wall, or else in association with a small hæmothorax; in the former case it was contralateral, in the latter homolateral. In other words, the contralateral massive collapse seen as a complication of hæmothorax has been either lobar in distribution or else has only involved a portion of one lobe. It is, of course, not probable that a patient could survive if suffering from a hæmothorax and massive collapse involving the entire lung on the opposite side.

Although contralateral massive collapse is not an uncommon accompaniment or complication of hæmothorax I have seen no case of massive collapse as a complication either of pleural effusion or of pneumothorax, notwithstanding the fact that a considerable number of cases of pneumothorax, the result of gunshot wounds, came under my observation. It would seem, therefore, that it does not arise as a complication of chest injuries or diseases when these are of more or less gradual origin as in pleural effusion, or, when, as in pneumothorax, their onset is marked by urgent dyspnœa.

Diagnosis.

The diagnosis of massive collapse is often difficult, more especially if the condition is not one familiar to the observer, and there can be little doubt that many cases are overlooked and regarded as of pneumonic origin.

Thus, from time to time cases are recorded in medical literature as cases of pneumonia of a peculiar character, in that the heart is displaced *towards* the pneumonic lung and where the symptoms of the patient are not such as to suggest the presence of pneumonia. When the massive collapse involves either an entire lobe or the entire lung curious errors of diagnosis are likely to be made. Thus I have known the condition mistaken for transposition of viscera in a case where after a contour wound of the left side of the chest the impulse was in the right nipple line and where the trivial symptoms present seemed to negative the possibility of collapse involving the entire right lung. Nevertheless, the progress of the case proved that this was really the nature of the case. The displacement of the impulse is sometimes attributed to cardiac dilatation, the physical signs at the left base being either overlooked or else attributed to compression of the left lower lobe by the supposed cardiac dilatation. I have known the sound normal side of the chest to have been opened under the impression that the displacement of the heart must have been due to some condition such as fluid, notwithstanding the absence of physical signs, the physical signs on the affected side being entirely overlooked or attributed to compression of the lung by the displaced heart. Further, operations have sometimes been performed on the affected side and the collapsed lung explored under the impression that the well-marked tubular breathing and râles indicated the presence of an intrapulmonary abscess. The most common error, however, is to attribute the signs present to pneumonic consolidation. This error can only be avoided by a consideration of the signs as a whole and by laying due stress on the cardiac displacement and on the absence of the symptoms of pneumonia. In most cases the diagnosis can be made with accuracy provided that it is recognised that such signs as tubular breathing are not necessarily evidence of pneumonic consolidation. In a few cases grave difficulty may be experienced because pneumonia may occur as a late complication in a collapsed lung; in such cases diagnosis would be very difficult, if not impossible, unless the patient was under observation prior to the onset of the pneumonia and when collapse alone was present. The massive collapse seen as a sequel of gunshot wounds is not,

as a rule, accompanied by urgent symptoms, and one of its most striking features is the absence of severe symptoms, notwithstanding the presence of very extensive physical signs. This may afford considerable help in diagnosis. Symptoms such as cough, dyspnœa, &c., would seem to be more marked in the post-operative variety of the affection seen in civil practice, more especially after abdominal operations, and it may be that these cases are rather of a different type.

Complications.

Complications in the massive collapse following gunshot wounds are, on the whole, rare, but certain inflammatory complications may develop in the collapsed lung, such as pneumonia, purulent bronchitis, and sometimes pleural effusion.

In cases under observation it can be clearly ascertained that these are true complications in that they supervene on an initial condition of pure collapse, but if only seen after the complication has developed it is probable that their true nature would not be recognised. When a pleural effusion develops as a complication in a case of massive collapse very remarkable physical signs are produced in that the pleural effusion may cause a displacement of the heart, so that it tends to return to its normal position, the retraction of the chest still persisting. With the increase in the size of the pleural effusion the retraction of the chest wall diminishes and may disappear, and then the signs become similar to those of an ordinary pleural effusion. It is, however, of interest that for a time in such cases retraction of the chest may be present; room is found for the fluid not by bulging of the chest wall but by displacement of the heart. The occurrence of bronchitis as a complication of massive collapse is also of interest, as it is in marked contrast to the absence of bronchitis in lung collapsed beneath a hæmothorax, a point I have already alluded to in the earlier part of this lecture. I am under the impression that those inflammatory complications in massive collapse are more liable to occur in the cases of post-operative origin, and in those complicating severe gunshot wounds of the buttocks and thighs. I have not seen them in the cases of massive collapse following the slighter non-penetrating wounds of the chest wall, although the massive collapse present in these cases may be of the most extensive variety and involve the whole of one lung. In cases where death has occurred as a result of pneumonia involving a collapsed lung, it is of interest that on post-mortem examination the lung, although solid, is not of the large size usual in pneumonia. This is especially obvious where both the collapse and the subsequent pneumonia have been limited to one lobe.

Nature of Massive Collapse.

There are many difficulties in the way of any simple explanation of this remarkable condition, and more especially of the variety described above as contralateral collapse, the sequel of non-penetrating wounds of the chest. Collapse of the lung is so readily produced by anything obstructing the bronchial passages that it seems natural to invoke some such mechanism in these cases.

Where massive collapse in one or other of its forms occurs as a sequel to a penetrating wound it must necessarily be difficult to exclude the possibility of the presence of blood or other foreign body in the bronchi in any given case. In the case of non-penetrating contour wounds with no symptoms of any urgent character it would seem very unlikely that any such cause is operative, more especially in the contralateral cases. The practical question would seem to be whether the immobility of the thoracic parietes in these cases is the cause, and the pulmonary collapse the result, or whether the chest wall is immobile because the lung is collapsed primarily. In the absence of any evidence pointing to the presence of a foreign body in the bronchial passages, the only other mechanism would seem to be obstruction of the bronchioles by muscular contraction or pathological exudation. It is difficult to accept either of these possibilities to explain massive collapse involving an entire lung in the absence of any symptoms pointing to bronchial obstruction. Lesions of the smaller bronchi causing obstruction to the entry of air produce symptoms and signs of considerable urgency; in these cases these phenomena are absent. In cases where a patient is confined to bed or has to assume some constrained posture, the hampering of the full respiratory movements of the chest may lead to the retention of secretions in the bronchial passages, and so increase or perhaps produce some varieties of collapse; but such an explanation will not meet the cases of massive contralateral collapse. Impairment of the movements of the chest wall and of the diaphragm are, however, most important factors in causing collapse of the lung directly, as has been noted by previous observers, especially J. Pearson Irvine, and W. Pasteur. If the respiratory movements ceased on one side of the chest the lung on that side might collapse, if not by the "deflation" postulated by Pasteur, at least as a result of the absorption of the air in the lung by the circulating blood. There is perhaps no great difficulty in attributing massive collapse to loss of respiratory movement of the thoracic wall and diaphragm, and some of the facts I have brought to your notice would seem to suggest that the chest wall is not merely passive. Thus, in hæmothorax, where retraction of the chest wall may be well marked, the heart is displaced, as in pleural effusion, away from the affected side. It is difficult to understand how this comes about if the condition of retraction is not an active one. Further, in cases of massive collapse, when pleural effusion occurs as a complication, the heart undergoes the usual displacement. The difficulty is not that immobility of the thoracic parietes is not an adequate mechanism for the production of collapse, but rather that it is so difficult to understand how this condition should supervene on one side of the chest as the result of a more or less trivial injury to the opposite side. The condition of the chest wall presents some analogy to that of the abdominal wall in cases of injury or disease of the viscera, but it is doubtful whether it is more than an analogy and it would seem as if more experimental work is required before an adequate explanation of the phenomena of massive collapse can be given.

The study of these cases of massive collapse of the lung as the result of gunshot wounds suggests that collapse of the lung is a very common, perhaps the most common, result of a gunshot wound of the chest, although in a very large proportion of cases its presence is masked by the development of a hæmothorax. I am of opinion that this is the reason why the physical signs of a simple sterile hæmothorax are so often different from those of a pleural effusion. In the latter the collapse of the lung is produced gradually in association with the pleural exudate; in the former massive collapse of greater or less extent is produced more or less suddenly, and the hæmorrhagic effusion of the hæmothorax is only in part responsible for the collapse of the lung present.

ON THE

END-RESULTS OF PERIPHERAL NERVE INJURIES TREATED BY OPERATION.

(Being the substance of an introductory address to the Section of Surgery at the Annual Meeting of the British Medical Association.)

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IN civil life injuries to the peripheral nerves, although by no means rare, do not occur in sufficient numbers to allow of the collective investigation which they receive in war. Hence much of our earlier clinical knowledge was founded upon the work of Weir Mitchell during the American Civil War, and since that time research has been conducted mainly either on experimental or pathological lines or on the limited clinical opportunities of a few observers. The European war has again supplied us with a large amount of material, which has been thoroughly studied, and which has been treated under the most modern surgical conditions.

Great numbers of these cases have been submitted to the operation of secondary suture, and not a few to that of grafting, so that we may hope that it will be possible ultimately to express almost in a statistical form the end-results which have thus been obtained. This day, however, has not yet arrived, and a long period of time and a careful series of observations by neurologists and anatomists will be required for full investigation. We are thus not yet able to give a perfect picture of end-results; all that can be done is to collate some of the more complete records and to formulate what may perhaps be regarded as an interim report.

The Legitimate Limit of Hope.

It may now be agreed that the regeneration of a peripheral nerve is in all cases accomplished by the downgrowth of axons from the proximal end into

channels or sheaths awaiting them at the peripheral end. The proximal axon is connected with a sensory or motor neurone, while the peripheral sheath leads to, or is connected with, a terminal organ, either motor or sensory.

Apart altogether from anatomical continuity, it must be recognised that repair which may lead to a good functional result requires that a sufficient number of axons shall enter into a sufficient number of peripheral sheaths which are capable of leading them in the right direction. Thus, for example, motor axons entering channels connected with sensory terminals are probably lost for ever, and so with afferent axons which become connected with muscle-endings. So far as I know, the union of a purely motor with a purely sensory nerve is not followed by any physiological connexion whatever.

Clearly, motor axons must enter motor channels and afferent axons sensory channels. Not only is this the case, but it is important that as far as possible the down-growing axons should enter the identical channels for which they were originally intended. Thus, if the spinal motor cells for, let us say, the extensor longus pollicis become connected with the peripheral channels for the brachialis anticus, which lie in the same nerve, physiological confusion will result, and the spinal cord will not be able to produce the movements which the brain demands.

Similarly, irregular connexion of afferent nerves with terminal organs in the skin or elsewhere for which they were not intended will necessarily lead to more or less of chaos in the interpretation of afferent impulses. No doubt errors of this type can be to some extent corrected by means of education, but such re-education will be necessary in the great majority of cases of nerve suture, and it is especially necessary in connexion with suture after the excision of large cicatrices from complicated junctions such as the brachial plexus.

Macroscopic and Histological Shunting.

We are thus brought face to face with the question of shunting, or, as the French call it, "aiguillage," of axons into peripheral channels. Shunting may be gross or macroscopic, as when the proximal end of the hypoglossal or spinal accessory nerve is attached to the distal end of the facial, in which case a limited physiological result may be obtained. Motor axons here enter channels for which they were not intended, and the resulting movements are confused and imperfect, but they can and do occur.

The gross shunting of a purely sensory on to a purely motor nerve or vice versa can produce no result at all. The operation which has been adopted in the past of implanting the two ends of a cut nerve into an intact adjacent nerve ignores altogether the essential linking up of original channels, and has in practice entirely failed. In this connexion I would urge that the word anastomosis, which is founded on a false analogy beween nerves and hollow channels such as blood-vessels, should be entirely abandoned. Anastomosis in the real sense of the term never occurs, and the use of the word is apt to lead to confusion of thought.

Apart, however, from gross or macroscopic shunting, histological shunting probably occurs in the vast majority of operations. In the case of end-to-end suture every endeavour is made to avoid errors in shunting by preventing rotation of the approximated ends; but even with this precaution some error probably always occurs, owing to the nerve fibres running in a spiral course, so that, however perfect the anatomical adjustment, the minute apposition is not likely completely to restore the axons to their original channels. To a much greater extent this difficulty arises when a graft has been interpolated. In such cases the axons of the proximal end are expected to enter the neutral channels of the graft, to pass through them, and then, so far as possible, to re-enter their proper channels at the other end of the graft. It is clear that under such conditions the prospects of correct shunting will be at least very greatly diminished, and that, even if good anatomical results can be obtained, the physiological results are likely to be most imperfect.

Economic Value of the End-result.

We have one other consideration of importance in judging of an end-result. Such a result can be anatomically good in the sense that nerve continuity is restored; it may be physiologically or neurologically satisfactory to the extent that on stimulating the nerve every muscle with which it is connected may be made to contract and the whole of its cutaneous distribution may present at least some sensation, but we have also to consider what I may call the economic value of the end-result.

A result which is neurologically good may be economically poor, in the sense that the patient is unable to use the affected part as he ought to do. Such defect may be due to psychical conditions, to the secondary changes of muscular atrophy or of arthritis, or possibly to a form of ataxia in which, while all muscles are capable of action, they can only be properly used while their action is under visual control. This local ataxia, which may render economically imperfect an otherwise excellent limb, is probably due to want of restoration of the deep afferent fibres by which are judged and controlled perfect muscular action.

Alternatively, and more fortunately, the economic result may be better than the physiological result. Thus in cases of injury to the ulnar nerve with well-defined symptoms, those who do not require the finer movements of the hand may find little practical inconvenience, and even a complete lesion of this nerve may exist without recognition by the patient. Again, vicarious movements may admirably replace those of lost muscles. How varied such vicarious movements may be and to what a degree patients may conceal paralysis which actually exists is well illustrated in a recent paper by M. F. Forrester-Brown.[1] Vicarious movements and substituted movements of this type have an enormous economic value, but they constitute a veritable pitfall in the estimation of neurological results for those who are not constantly upon their guard or not thoroughly familiar with the possibilities of misreading end-results. The importance of their consideration is illustrated by the fact that I have personal knowledge of cases reported by good observers as "cured" in which there is no neurological evidence whatever of regeneration; and it is never possible to rely upon the statements of patients as evidence that recovery has occurred after operation.

A Summary of Reported Results.

Turning to some of the more extensive series of reported results, they may be thus summarised:—

Of 108 personal cases of suture or grafting analysed by Tinel,[2] 14 were complete failures, 22, or say 20 per cent., showed practically complete recovery, and the remainder were regarded as improved.

S. W. Daw[3] says that 40 per cent. of his cases showed signs of returning motor power after seven months.

J. Sherren[4] found that of 21 cases of secondary suture some return of motor power took place in all, but that it was never complete.

R. Kennedy,[5] examining after a long period cases occurring in civil life, claims that 73 per cent. of all sutures were completely successful.

Dumas[6] investigated 115 personal cases of operation for war wounds of one nerve only, the musculo-spiral; but it must not be forgotten that for several reasons this yields better results than any other nerve. He claims evidence of recovery in 42 per cent. of his cases, and of some regeneration in 65·2 per cent., the remaining 35 per cent. being presumably entire failures.

J. L. Joyce[7] found in 36 cases of secondary suture 8 recoveries, 6 with considerable improvement, 8 with some improvement, and no result in 14.

H. S. Souttar and Twining[8] found that of 61 cases of

[1] M. F. Forrester-Brown: Brit. Jour. of Surg., April, 1920, p. 495.
[2] Tinel: Nerve Wounds, London, 1918.
[3] S. W. Daw: Orthopædic Effects of Gunshot Wounds, London, 1919.
[4] J. Sherren: Injuries of Nerves, London, 1908.
[5] R. Kennedy: British Journal of Surgery, October, 1918, p. 317.
[6] Dumas: Bull. et Mém. de la Soc. de Chir., June 5th, 1917.
[7] J. L. Joyce: British Journal of Surgery, January, 1919, p. 418.
[8] Souttar and Twining: Brit. Jour. of Surg., October, 1918, p. 279.

suture 7 recovered, 32 were recovering at the time of report, 7 were doubtful, 2 were failures, and 13 were not traced; but their results, like those of Joyce, would probably be improved by a later report, as in many cases the time elapsed had not been sufficiently long.

Adson[9] reports the results of operation on 41 cases, four-fifths of which were end-to-end suture and the remainder plastic operations. Of 30 cases traced "the average amount of improvement obtained was 58 per cent. return of the sensory, 62 per cent. return of the motor, and 67 per cent. return of the trophic function"; 73·1 per cent. showed improvement.

These figures, which are by no means easy to compare, leave the impression that secondary nerve suture gives very good results in somewhere between one-third and two-thirds of all cases, but the most careful study of original articles, as well as my personal experience, leads me to believe that a perfect neurological recovery is rarely if ever obtained. Permanent disability may be masked in various ways, but is almost invariably to be detected if carefully searched for. Complete failures are by no means uncommon, and must be looked for in a very definite percentage of even the best operations. Such appear to be the general results in the case of secondary suture.

Grafting as a Last Resort.

In the case of grafting, as we have already seen, much less is to be hoped for. Certain isolated cases are reported in which brilliant results are claimed, and it is, of course, possible that the anatomico-pathological difficulties to which I have referred may occasionally be overcome, but there is certainly as yet no large number of good results obtained from grafting. Personally I have no experience at all of this operation, and it will, I think, be found that the greater the experience of end-to-end suture the less often the need for grafting will be found to arise. So much can be done by bold operating, by extensive exposures, by thorough stretching of nerve trunks, by alteration of their anatomical course into a shorter bed, and by the operation of stretching in two stages that grafting will always be, and should always be, a last resort. I have yet to see personally any cases in which it has been a success. I have seen cases in which it has been reported as successful, but which to my mind did not carry conviction. I hope, however, that there are those present who will be able to establish a claim to have obtained results more fortunate than I have met with.

A number of facts now well established materially influence our prognosis in the case of different nerves and different levels of these nerves. Nerves which supply large muscles, and especially muscles of homogeneous type, such as the musculo-spiral, give much better results than those whose muscular distribution is small and complicated, such as the median and ulnar. Nerves also which are mainly motor or mainly sensory are more amenable to treatment than those whose function is more complicated. In both these cases, no doubt, the ill-effects of bad shunting bear more heavily upon the more complicated trunks. Dual lesions are more serious than single ones, so that a combined injury of the median and ulnar nerves is susceptible of very little improvement indeed.

Factors in Recovery: Time.

The time required for recovery is very great. On the basis of what is known as Tinel's sign the downgrowth of axons occurs at the rate of about 1 mm. per diem, which would require, say, 200 days for a fibre to grow from the wrist to the tip of the index finger, or two years from the middle of the thigh to the foot. The slow return of epicritic sensation, even after a perfect primary suture, is admirably indicated by Sherren's operation upon Head. An ophthalmic surgeon under my care some years ago divided the digital branches of his left middle and ring fingers near the web by a cut from a piece of glass, and did not obtain perfect tactile sense for 18 months or two years.

On the other hand, the rate of recovery is not in such direct proportion to the length of nerve to be traversed as was formerly believed, and probably a large share of the time actually occupied is required for the linking up of axons with end-organs and for re-education. In this connexion J. S. B. Stopford[10] has some most interesting figures; analysing 58 cases of suture of the musculo-spiral nerve in the lower, middle, and upper thirds of the arm he finds that the supinator longus begins to recover after about four, five, and seven months respectively, other muscles showing similar differences; so that it takes only about three months longer for recovery in a section close to the axilla than in the case of a section quite near to the origin of the branch for the supinator longus.

It would also appear from the work of Professor Stopford, who has most carefully tested 271 cases of nerve suture, that recovery is more perfect the nearer the suture is to the spinal cord, which may be due to its closer connexion with its trophic centre or to the greater ease of surgical operation upon thicker trunks.

Before concluding I should like to refer to the so far unpublished results obtained at the Grangethorpe Military Hospital in Manchester, staffed by old students of my own, with whose work I am thoroughly familiar. Most of the operating work here has been performed by H. Platt, and the results have been checked by Professor Stopford from a purely anatomical and neurological point of view. In a recent communication to the Royal Society of Medicine Professor Stopford states that in no cases of secondary suture can the result be described as perfect. At the best there has been a perceptible difference in power when comparing the two sides, and at least an incomplete recovery of epicritic sensibility, even three and a half years after the date of the suture. The recovery of sensation has been particularly disappointing.

Local Peculiarities.

Of sutures in the upper arm, failures amounted to 12 per cent., and in the forearm to 24 per cent. At both levels the recovery of voluntary power has been much less over muscles supplied by the nerve in the distal than in the proximal part of the limb. On the whole, it may be concluded that a good functional result is to be expected after secondary suture of the musculo-spiral nerve. The extensors of the wrist usually regain full power, the extensor communis digitorum recovers satisfactorily, but the extensors of the index finger and thumb are much less perfect.

As regards the median nerve, in quite a large proportion only incomplete recovery of protopathic sensibility has occurred, and voluntary power in the abductor brevis pollicis has only been found in 45 per cent. The ulnar nerve is particularly disappointing, and the recovery of voluntary power in the small intrinsic muscles of the hand was exceedingly poor. On the other hand, from the economic point of view, it is interesting to note that many of these injuries to the median and ulnar nerves did not prevent the patients from obtaining employment. I do not propose to weary you with details in reference to the nerves of the lower limbs.

These remarks apply to cases which date back for a period of three years; still further lapse of time may improve them, but will also tend to confuse the issue by permitting of improved vicarious function. As they stand they are, I believe, a perfectly fair expression of the best efforts of the surgery of to-day.

As to the dates at which recovery, if any, can be expected after the operation of nerve-grafting we have no reliable statistics, and the comparatively few records of such recovery which will even bear investigation are not numerous enough for generalisation.

Treatment of Nerve Compression.

In the treatment of compression of nerves my own experience has been very considerable, and almost, if not quite, uniformly successful. I have in the past had many examples of operation for compression of nerves, and I do not think that, however grave the symptoms, I have ever failed to obtain recovery which was at least economically complete; I have not the details to

[9] Adson: Annals of Surgery, August, 1919, p. 169.

[10] J. S. B. Stopford: Brain, vol. xliii., Part I., 1920.

show how far they were neurologically perfect. My personal experience thus differs sharply from that of Kennedy, who found that neurolysis yielded slightly less good results than nerve section and suture. I have only one reservation to make: after the removal of pressure by cervical ribs it is most rare for atrophy of muscles to be entirely repaired; this I am inclined to attribute to the fact that a chronic neuritis has followed the original pressure lesion, and that such neuritis leaves indelible changes which are rarely found in traumatic cases of pure compression.

I have not painted the picture in rosy colours; the greatest optimism is generally that of the man who records a few remarkable cases—often a single case. After many years I can only say that if a surgeon obtains 50 per cent. of really good economic recoveries after secondary nerve suture he is doing well; if he obtains 75 per cent. of such recoveries, which will bear investigation, his work is both brilliant and fortunate.

PROGNOSIS IN CERTAIN AFFECTIONS OF THE HEART.[1]

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To those who are suffering from affections of the heart prognosis is of the utmost importance. The parents of the boy whose heart was strained ask whether he may safely indulge in any form of athletics at school; others wish to know whether the condition of the heart will debar their son from entering one of the Services. The young man wonders whether the valvular heart disease for which he was invalided from the army is any bar to his intended marriage, or a life assurance company may desire to know his expectation of life. The anxious wife's first question is will her husband be spared, and he himself soon begins to inquire whether he can look forward to complete recovery, or whether he must needs relinquish all, or only some of, his former activities. To the physician prognosis is also an important problem because the treatment he recommends is often based not only upon a correct interpretation of the patient's symptoms and physical signs, but also upon a reasonably accurate forecast of the degree of health to which the patient may be restored.

It may be said that prognosis in heart disease is notoriously speculative and uncertain, and it is true that many intercurrent factors may arise and upset our most careful estimate of the patient's future. Nevertheless, there are certain general principles which we recognise as of the utmost value in guiding us to the knowledge that whereas one patient will make a complete recovery and another may look forward to some years of relatively good, though impaired, health, the life of another is fast drawing to a close.

Prognosis is primarily always dependent on accuracy of diagnosis. The precise data furnished by radiograms, the sphygmomanometer, the polygraph, and the electrocardiograph have placed diagnosis on a firm basis, and the co-relation of this knowledge with symptoms and physical signs has now become so well-established that in practice we can usually dispense with the electrocardiograph and other elaborate instrumental methods.

Cardiac Affections.

The prognosis in relation to cardiac affections is practically always more favourable if organic disease of the heart can be excluded. I do not hold with the theory which sought to minimise or to deny the unfavourable effect of organic valvular disease. Now, no one seriously believes that men with organic valvular disease are really first-class lives, or even that they are fit for military service in category A. It is true that some men with organic valvular disease are fit for a hard game of football, or for strenuous physical work, but these cases are exceptional. In the course of the acute endocarditis from which the patient suffered some years previously there were probably more focal inflammatory lesions in the myocardium than we suspected, and these must have left some permanent damage to the heart muscle. Consequently a chronic valvular lesion, apart from the mechanical disability it imposes upon the heart, thereby lowering its reserve force, is often associated with at least some degree of chronic myocarditis.

The prognosis, however, should never be founded solely on a study of the heart. We have to take into consideration the patient's age, sex, and occupation, the state of the arterial walls, the blood pressure, the efficiency of the kidneys, and the state of the pulmonary and other systems. Moreover, we have to remember that chronic degenerative changes due to spirochætal infection are slowly progressive, this being of particular importance in relation to aortic incompetence; whereas acute rheumatic lesions of the myocardium and endocardium are liable to recur, especially if the primary source of infection, whether it be in the tonsils or elsewhere, cannot be located and removed. Even after all the available data have been elicited and weighed we are reminded of the fact that no two cases are exactly comparable, and that each individual case must be judged on its merits.

I do not propose to enter upon the consideration of the phenomena associated with the patient's response to physical exertion, though this is of the greatest value in determining the functional state of the heart muscle, and consequently in ascertaining, for example, whether there is some degree of cardiac failure in addition to valvular disease. Nor shall I consider the symptoms and signs which collectively indicate pronounced cardiac failure, nor the prognostic significance of deficient renal activity in heart disease; but I shall limit my remarks to certain of the more common cardiac disorders which we encounter in the course of our daily work.

Dilatation of the Heart.

Let us first consider the prognosis in dilatation of the heart. I shall not deal with the dilatation which follows as a late and often terminal result of myocarditis, with or without valvular disease, but wish to speak of the cardiac dilatation which apparently ensues as a direct result of some unusual physical stress, or which is first recognised during, or in the early phase of convalescence from, an acute infective illness.

In regard to the former group of cases—namely, those usually spoken of as cardiac overstrain—it may safely be affirmed that physical exertion never causes a pathological degree of dilatation in a perfectly healthy heart. The recognition of this fact renders it difficult, or impossible, to give a wholly favourable prognosis to a patient suffering from cardiac overstrain, although the immediate prognosis may be good. The patient has usually attained an age which makes it almost certain that arterio-sclerosis has already begun, and we remember that age is a matter of tissue change, not merely of years.

The case of a joiner, aged 52, affords a good illustration. He was employed in a colliery, and enjoyed excellent health until he volunteered for the unaccustomed work of firing boilers during a miners' strike. Ten months later he was still breathless and fit for little work; the heart was preserving its normal rhythm, there was no dropsy, and no murmurs were audible, but the blood-pressure readings were high, the diastolic pressure being 85 and the systolic pressure 170, and after slight exertion the pulse-rate took four minutes to decline to its pre-exertion rate of 90. In such cases of cardiac overstrain the patient must be content to live on a lower plane of activity than formerly. He must avoid calling upon the heart, the reserve force of which is lowered, for more work than it can successfully undertake, and any physical effort which occasions dyspnœa, pain, or præcordial distress is harmful. The best advice to give to most of these patients is that which I learned from Cowan, of Glasgow—namely, that an active or a merry life will mean a short one.

In cases of cardiac dilatation from acute infective disease the chief difficulty centres in the question of

[1] A paper read before the Medico-Chirurgical Society of Edinburgh on July 7th, 1920.

diagnosis. The patient has passed through an acute febrile illness, often of rheumatic or influenzal nature, the heart has become slightly enlarged, the pulse-rate remains somewhat too frequent, and a systolic murmur has become audible. Has one of the valves been damaged by endocarditis or is the heart merely dilated? It is principally when the systolic murmur is maximal at the cardiac apex that we have to consider the possibility of its being an indication of recent endocarditis which, even although the immediate prognosis be favourable, will leave the mitral valve permanently damaged and will probably cause grave incapacity in the course of years. My own experience has taught me that an apical systolic murmur is almost certainly due, not to organic mitral incompetence, but to dilatation if the apex-beat is not displaced and not unduly forcible, if the murmur is soft in quality and confined to the apical region, if the intensity of the murmur varies notably with change of posture, and if the pulse retains its physiological respiratory irregularity. The conclusion thus arrived at is strengthened if the patient is anæmic, and if there is a functional systolic murmur at the pulmonary, and possibly also at the tricuspid, area.

In these cases of cardiac dilatation the prospect of complete recovery is good. The murmur may persist for weeks or months, but ultimately disappears entirely. It is now a frequent experience to find the heart perfectly normal in men who one, two, or three years ago were invalided out of the army because they presented a mitral systolic murmur which had led to a diagnosis of V.D.H. We are now observing on a vast scale the phenomena to which George Balfour drew attention in his classic observations on "curable mitral disease."

Disorderly Action of the Heart.

Passing to another common disorder, D.A.H., we recognise this as a symptom-complex, protean in origin, and by no means confined to those who have served in the army. When the man who was always a weakling, unfit to play games at school, and who found his true level in a quiet, sedentary, unambitious walk of life attempts to undertake larger responsibilities, he becomes incapacitated by the giddiness, fatigue, palpitation, præcordial pain, and other symptoms characterising this disorder. We all recognise that this type of person will never become robust. Those in whom the disorder has arisen as a sequel to shell concussion, or in civil life to some other form of trauma, may be expected to improve slowly if under judicious treatment.

After excluding these cases, and those in whom we find visceroptosis, obesity, arterio-sclerosis, early pulmonary tuberculosis, hyperthyroidism, and so forth, we find that in over 40 per cent. of all patients who are said to suffer from D.A.H. there is evidence of some recent infection, and in an additional 10 per cent. there is anæmia, presumably of toxic origin. In all these cases—50 per cent. of the total—the prognosis is, in my opinion, good. The disturbance may be essentially one of the endocrine glands or of the autonomic nervous system, but it is not the heart that is primarily at fault. If we give a guarded prognosis, keep the patient confined to bed, permit the attention of devoted relations, administer digitalis (which is of no value to the patient), and exercise an anxious watchful supervision lest the patient overtax the heart, we confirm the patient in the belief that he is suffering from serious heart disease, and the condition progresses from bad to worse.

A good prognosis is the first essential in restoring the patient's confidence. He must be told he is not suffering from heart disease, that the heart is healthy, and that he will make a complete recovery. He should not be allowed to lie in bed; the less he is waited on and the more he does for himself the better, for the more he accomplishes the greater the degree of self-confidence he regains. During the first few days massage and passive exercises are of value. When he first begins to walk about his tolerance of exercise is naturally poor, but he should be encouraged to undertake an increasing amount of physical exercise daily. Within a few days he should be performing active physical exercises under skilled supervision; he is then encouraged to take active exercise out of doors. Drugs are seldom indicated; digitalis is wholly useless.

This method of treatment seldom fails, and is usually speedily and eminently successful in restoring the patient to health. It was so in the army. Of nearly 2000 men under my supervision, 69 per cent. became fit for full duty in the front line; and in 1918, when our organisation for physical testing and training had reached its maximum efficiency, no less than 86·9 per cent. of Class A men, admitted to hospital for D.A.H., became fit to rejoin their units. Relapses very seldom occurred.

In civil life the prospects of full recovery are not so uniformly good. The patient does not lead such a healthy life as does a soldier in a command depôt; he is now less amenable to control. Physical training, needing skilled supervision, is costly and not so efficient as it was in the army; there are devoted relatives whose influence is the reverse of helpful; and in certain grades of the community there is the sure expectation that incapacity for work will be compensated by grants from public funds. Nevertheless, brilliant results may be obtained, even under the adverse conditions of civil life, and a man or woman who has been practically bedridden for months may, within a few weeks, be leading an active and useful life. The cases in whom the dominant manifestations are those of neurasthenia are the most intractable and the most prone to relapse.

Extrasystoles.

Passing to the most common of all forms of cardiac irregularity—namely, extrasystoles. The prognosis should never be based on the extrasystoles alone, but rather on the underlying cause. If they are due to sympathetic stimulation of the heart under the influence of the emotions, or to obvious toxæmia from tobacco, and if the patients are otherwise healthy a favourable prognosis may unhesitatingly be given. Extrasystoles are likewise not of serious significance if they arise, even without definite cause, in young adults in whom the heart is healthy and in whom there are no signs of cardiac failure. That the immediate prognosis in these cases is good is demonstrated by the fact that of 34 soldiers sent to the base solely on account of extrasystoles 22 were proved to be fit for category A after a short stay in hospital and in a training centre. In civil life the conditions are equally favourable for recovery. I cannot recall a single instance of extrasystoles, arising in a young man or woman whose heart was otherwise normal, being the precursors of more grave heart affections. In illustration I refer to one patient who, at the age of 48, was suffering from syphilis of the lung, the arteries were healthy, and the heart, save for extrasystoles, was normal. Seven years later he was in rude health. In another, aged 41, extrasystoles were observed during a mild rheumatic attack. He made a complete recovery and enjoyed good health for nine years, when the strain of carrying on his business during the war led to insomnia and other nervous symptoms, and in the course of examination a slight mitral leak was detected.

In patients over 40 years of age, however, extrasystoles arising without obvious cause should be regarded with some suspicion, for they probably indicate commencing sclerosis of the coronary arteries. The extrasystoles are the first danger signals, and the man's expectation of life is not first class, although it may be several years before any further manifestations of arterio-sclerosis can be elicited. In these cases the determination of the blood pressure is of particular value, for we know that arterio-sclerosis is often the direct sequel to high blood pressure. In cases with any symptoms of cardiac failure a most careful examination of the pulse should be made in order to ascertain whether there is any alternation of the pulse after the extrasystoles. Even transient alternation, with alternate weak and strong beats, is always of evil omen, and I am in accord with those who find that these patients seldom survive for more than one, or at most two, years. In the aged extrasystoles are not only frequent, but are usually attended with remarkably few symptoms and with a relatively good prognosis.

Extrasystoles arising in the ventricles are, on the whole, attended with a better prognosis than those arising in the supra-ventricular portions of the heart—namely, auricular and nodal extrasystoles. Whereas a man with ventricular extrasystoles and thickened arteries may continue at his work for some years before becoming seriously incapacitated, the heart of an individual with auricular or nodal extrasystoles has been failing before they were observed.

The isolated, or single, extrasystole is of lesser significance than multiple extrasystoles occurring in series and causing momentary attacks of palpitation or of tremor cordis, because multiple extrasystoles are not infrequently the forerunners of paroxysmal nodal tachycardia, of flutter, or of fibrillation.

Auricular Fibrillation.

Lastly, as to the prognosis of auricular fibrillation. When this begins we know that the last act has begun. How long will it be before the curtain finally falls? It may be within a few weeks or it may be ten or more years. The prognosis is generally more favourable in those with mitral disease than in those with arteriosclerosis and myocardial degeneration. Apart from this there are four great factors which influence the prognosis: (1) Those without much acceleration of the ventricular rate suffer least and survive longest, whereas a high ventricular rate is unfavourable. (2) The response of the heart to digitalis. Those in whom the ventricular rate is readily controlled by this drug or by strophanthus may for years lead quiet lives with little discomfort. (3) Those in whom the ventricles do not become dilated remain comparatively well, whereas in those who develop dropsy the prognosis is much more grave. The first attack of dropsy is seldom fatal, but it recurs from time to time, and on each occasion recovery becomes more tedious. (4) Finally, we may observe symptoms and signs of chronic nephritis; the cardiac patient has become a cardio-renal one, and we know the fatal issue is within measurable distance.

EFFECTS OF HOT AND COLD APPLICATIONS ON THE SUPERFICIAL AND DEEP TEMPERATURES.

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THAT the local application of heat or cold to the surface of the body is of value in the treatment of a variety of clinical conditions is well known, but no data apparently exist to show the extent to which the application causes actual change in the temperature of the underlying tissues. With the aid of the Research Committee of the Medical Services of the Department of Militia and Defence of Canada we have undertaken to carry out a series of observations to collect such data, and the interesting and definite character of the results has prompted us to offer a brief account of them at the present time.

The Apparatus.

The observations have been conducted on rabbits. Heat or cold was applied over an area of shaved or closely clipped skin by means of an appliance which we have styled the "applicator." For heat two types of these have been used—either an electric pad (9·5 cm.), giving with 0·6 amps., temperatures ranging up to 55° C., or a water applicator, consisting of a glass tube of 20 mm. internal diameter, closed at one end by a thin rubber membrane and having water from a heat-insulated reservoir circulating through it at a definite and constant temperature.

The exact temperatures at the point of contact of the applicators with the skin was recorded from time to time during the observations by means of thermo-electric couples placed either in the cloth covering the electric pad or just inside the rubber membrane of the water applicator. To measure the temperatures of the tissues thermo-electric couples mounted within hypodermic needles were used. The couples were made of copper constantin wires, the ends being twisted together, and the junction coated with shellac. The sharp ends of the hypodermic needles were sealed with a little solder, so that the couple, occupying about 4 mm. of the needle, lay as near as possible to its point.

The position of the thermo junction in the tissues was determined by measurement of the depth to which the needle was inserted into the tissues, and the angle which it made with the surface. The couples were connected with an Ayrton-Mather dead beat galvanometer, and with a Leeds and Nothrup precision potentiometer, giving direct readings down to 1μV. Since the above couples have a thermo-electric force of 40μV. per degree C., this means that differences of $\frac{1}{40}$° C. could be measured with precision. The couples were calibrated by placing the hot junctions (in the hypodermic needles) in a bath of warm water with a stirrer and noting the temperature differences corresponding to given E.M.F.'s. The cold junction was placed close to the bulb of a sensitive certified mercury thermometer in water near room temperature in a large Dewar flask. From the results a calibration curve was constructed. The above method has been adopted after trial of several others, and we are greatly indebted to Professor E. F. Burton, of the Physics Department of Toronto University, for his valuable assistance in this part of the work.

Observations of Normal Temperatures.

A series of preliminary observations of the normal temperatures in the muscles and rectum were made, both before and during the application of local heat at a point of the body far removed from the the thermo couple; Table I. gives the results.

TABLE I.

Temp. in muscle.		Temp. in rectum.		Duration of observation.	
Initial.	Heating opposite leg.	Initial.	Heating leg.	Before heating.	During heating.
°C.	°C.	°C.	°C.	Min.	Min.
38·0–37·3	37·3–37·2	—	—	33	24
38·2–38·2	38·2–38·8	—	—	15	70
37·2–37·2	37·2–37·9	—	—	10	75
39·7–37·5	37·5–37·5	—	—	85	15
38·2–38·0 lft. 37·6–37·5 rt.	—	—	—	65	—
38·0–37·0	37·0–37·0	38·0–37·4	37·4–37·3	62	10
39·7–39·8	39·7–39·2	—	—	28	50
37·2–36·0	—	38·0–38·0	—	57	—
37·7–36·9	36·9–37·0	37·6–36·7	36·7–36·4	50	32
38·4–38·4	38·4–38·2	38·7–39·0	39·0–38·8	20	25

Note.—These figures being taken from curves the second decimal is omitted.

The initial temperatures, it will be seen, varied in the rectum between 36·7° and 39° C. with an average of 37·92° C., and those in muscles between 36·9° and 39·7°, with an average of 37·90° C. Usually, the rectal temperature was a fraction of a degree above that in muscle, and the average deep temperature was somewhat above the normal usually given for rabbits. This difference is of no significance in the present investigation, the important point being that the deep temperature, as measured in the rectum or in muscle, did not change much over considerable periods of time and was not affected by the local application of heat to the surface of the body at some distance from the thermo couple, even when the temperature in the applicator was 15° C. above that of the skin.

The normal temperature under the skin varied according to whether the fur was clipped closely with the scissors or was completely shaved off. Without removal of the fur, in 13 observations on different days the skin temperatures varied between 36·9° and 39° C., the average being 37·94° C., or practically the

same as in the muscles; after removal of the fur by shaving the readings in nine different observations varied more widely (from 31·38° to 35·85° C.), with an average of 34·2° C. These results are important, since they illustrate the heat-conserving influence of the fur, the variability in the readings after shaving being, no doubt, dependent upon the cooling influence of the air. Observations on this relationship, in which the katathermometer of Leonard Hill is used, will be reported in a later communication. Meanwhile, it is interesting to note that the above observations were made during the winter months, when, although the room was artificially heated, its mean temperature was decidedly lower than during June. In five other observations made during this month the (shaved) skin temperatures, with one exception, were all over 34·4° C.

In all of the experiments in which the skin was shaved a second thermo couple was placed in the muscles immediately under, and at varying depths from, the one in the skin. The differences observed between the skin and muscle temperatures in degrees centigrade in 14 experiments were as follows: 3·27, 3·4, 1·2, 0·87, 2·16, 4·97, 2·93, 2·10, 0·12, 2·3, 1·9, 1·0, 3·2, and 2·4. The variability is mainly due to differences in skin temperature, that of the muscles being very much more constant. The figures indicate the extent to which the superficial blood loses heat by radiation and convection from the uncovered skin. General anæsthesia was not found to have any appreciable effect on these values.

Influence of Local Heat.

Coming now to the influence of local heat, the following types of observation have so far been made.

1. Temperature of skin of thigh on application of electric pad. The first observations were made with the fur unshaved, the initial temperature, as already pointed out, being, therefore, not appreciably different in the skin and in the muscles. Table II. gives, in condensed form, the most significant results.

TABLE II.

Temp. of pad.	Difference between temp. of pad and skin.	Temp. reached in skin.	Extent of rise in temp.	Temp. of pad.	Difference between temp. of pad and skin.	Temp. reached in skin.	Extent of rise in temp.
C.	°C.	°C.	°C.	C.	°C.	C.	°C.
43·5	6·3	42·1	4·9	50·2	11·9	43·2	4·9
44·8	6·9	42·7	4·8	50·65	13·55	44·6	7·5
46·65	8·65	42·45	4·45	50·8	13·2	42·8	5·2
47·5	10·6	42·1	5·2	55·05	17·85	45·15	7·95
48·55	9·35	43·2	4·5				

Up to a temperature difference of 12° C. the skin temperature, it will be seen, rose about 5° C., a moderately warm applicator having almost as great an effect as one that was considerably warmer. In later observations, in which the skin was thoroughly shaved, a similar relationship between the rise of skin temperature and the temperature of the applicator was not so evident. This is probably to be accounted for by the fact that in these cases the skin temperatures, as already pointed out, were considerably lower and much more variable than in the cases where the fur still remained on the skin.

The extent of lateral spread of the temperature change (on shaved skin) was found to be considerable. Thus, in four observations with the (water) applicator well insulated so that no heat could radiate on to the skin beyond its edge, no change was observed at 35 mm. distance, but was quite definite at 19, 16, and 10 mm., the applicators being at temperatures from 11° to 15° C. above that of the skin.

2. Temperature of skin and underlying muscle of thigh on application of hot-water applicator, to overlying skin.

Although the observations (see Table III. and Fig. 1) are insufficient to indicate the maximal depth to which locally applied heat may penetrate the tissues they show at least that this is considerable (over 20 mm.). The rise in the muscles is more gradual than under the skin. The heat of a poultice or of fomentations must therefore penetrate for a considerable distance, even into relatively vascular tissues.

TABLE III.

Temp. of pad.	Difference between temp. of applicator and muscles.	Temp. reached in muscles.	Rise in temp.	Depth of thermo couple.
C.	°C.	°C.	°C.	mm.
43·41	6·91	38·29	1·79	20
45·83	7·31	38·42	2·07	12
46·70	9·00	39·70	2·00	18
46·14	9·20	39·21	2·27	17
46·87	11·79	39·15	4·07	17
49·48	14·55	37·95	3·02	9
48·61	10·39	40·10	1·88	16
46·50	10·53	39·8	3·83	16
48·42	11·32	38·64	1·54	17

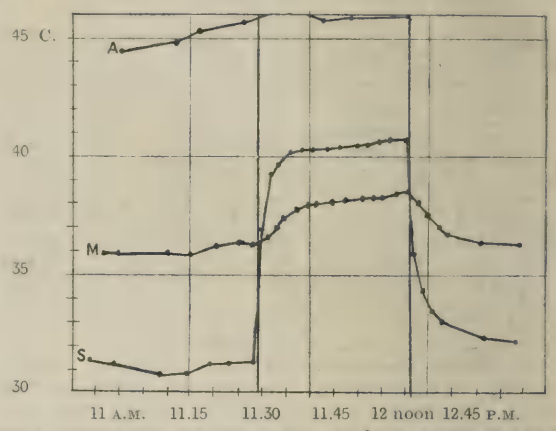

FIG. 1.—Curves showing temperatures (in ° C.) on ordinates at the times indicated on the abscissa, immediately under the (shaved) skin over the gluteal region and in the muscles at a depth of 12 mm. Both the thermo couples, by which the temperatures were recorded, were under the centre of the hot-water applicator. A., applicator. M., muscle. S., skin. The two vertical lines mark the time during which the heat was applied.

3. Temperature in various regions of the abdomen on application of heat to the abdominal wall. Needles were introduced in various regions of the abdomen and the electric pad applied unheated to the surface, and the current then gradually turned on. Even though the temperature of the pad, covering approximately one-half of the abdomen, was raised slowly to 55° C., there was no change in rectal temperature. On

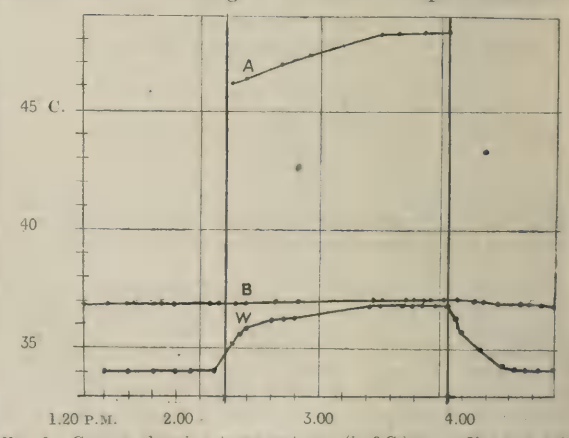

FIG. 2.—Curves showing temperatures (in ° C.) on ordinates at the times indicated on the abscissa, just within the abdominal wall and in the small intestine 30 cm. from the jejunal junction at a depth of 54 mm. from the hot-water applicator which was applied to the surface of the abdomen. A., applicator. B., intestine. W., just inside abdominal wall. The two thick vertical lines mark the time during which the heat was applied.

the other hand, the heat spread rapidly through the abdominal wall itself; thus, when the couple was placed just inside the wall and under the applicator a rise of 4° C. was observed with the temperature difference of 13·13° C. When the couple was 17 mm. distant from the edge of the applicator the rise was 0·32° C., and when it was 35 mm. distant no change in temperature occurred.

Between the abdominal wall and the rectum the temperature spread was found to be considerable, the observation being made on (anæsthetised) animals which were killed afterwards, and the exact position of the couple ascertained by dissection. It was found, with a temperature difference of 12° to 16° C. in the applicator (covering the upper left quadrant of the abdomen), that the temperature within the cæcum rose through from 3° to 5·16° C.; just behind the cæcum it rose 1·12° C. and in the wall of the ascending colon 4·04° C. The curves of one of the experiments of this series are given in Fig. 2, one needle (B) being just within the abdominal wall and the other (A) in the small bowel 30 cm. from the jejunal junction and 7·5 cm. from the point of application of the heat, at a depth of 5·4 cm. below the surface. The rise in this needle, though small (0·3° C.) is yet perfectly definite, and that it was an effect of the applied heat is indicated by the immediate fall following the removal of the applicator. The results in general show that when heat which is about 15° C. above that of the body is applied over approximately one-fourth of the surface of the abdomen a change in temperature may occur which may penetrate the abdominal viscera for a distance of about 75 mm., although it can only spread laterally for somewhat less than 20 mm.

Finally, we have completed a sufficient number of observations on the effects of cold to be in a position to state that the results are equally as definite as those for heat, the temperature change being, of course, in the opposite direction.

THE COMPLEMENT-FIXATION TEST IN PULMONARY TUBERCULOSIS:

ITS USE AS A MEANS OF DIAGNOSIS.

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(*A Preliminary Report to the Medical Research Council.*)

SINCE Bordet and Gengou[1] in 1903 demonstrated the presence of antibodies capable of uniting with tubercle bacilli and fixing complement in the sera of tuberculous animals, numerous attempts have been made to make use of this fact to obtain a reliable biological test for tuberculosis in human beings. A study of the literature of the subject indicates that although there has been considerable diversity in the results obtained by different observers, yet on the whole there has been a steady improvement in the technique employed and in the reliability of the results obtained.

This diversity in the results appears to be largely attributable to differences in the technique employed by various observers and more especially in the character of the antigen employed.

Previous Observations.

Wassermann and Bruck[2] in 1906 treated tuberculous patients with tuberculin and showed that the blood serum of such patients contained antibodies capable of fixing complement in the presence of tuberculin. Citron[3] subsequently showed that the blood serum of tuberculous patients who had not been treated with tuberculin exhibited the same property of fixing complement in the presence of tuberculin. Various other observers, such as Wolff and Muhsam,[4] Cohn,[5] Koch,[6] and others, elaborated the technique of Wassermann and Bruck, and by using tuberculin as an antigen obtained positive results in definitely tuberculous patients in from 33 to 78 per cent. of cases. Besredka[7] in 1914 found that by using a special tuberculin he obtained a large percentage of positive results in definitely tuberculous patients. Kuss,[8] Inman,[9] and others proved, however, that this antigen was not specific, in that a considerable number of non-tuberculous syphilitic subjects gave a positive reaction with it.

The most recent workers in this field have used an emulsion of tubercle bacilli as antigen; these included Frugoni,[10] Caulfield,[11] Dudgeon,[12] and, most recently of all, McIntosh and Fildes.[13] Here, again, the results have been variable. The last-named observers investigated a series of cases of tuberculosis of various organs. As the present investigation deals exclusively with pulmonary tuberculosis their figures will be considered in relation to this form of tuberculosis only. They obtained out of 43 cases of definite phthisis, as evidenced by the presence of tubercle bacilli in the sputum, 33 positive results, or 76 per cent. In 18 cases of "clinically certain" tuberculosis of the lung or pleura, not verified bacteriologically, they obtained ten positive results, or 55·5 per cent. As the diagnosis of a "clinically certain" case of phthisis is so largely dependent upon the individual clinician's criterion of what is "clinically certain," no definite conclusion can be drawn from these latter figures without some knowledge of what such criteria were.

Other workers using an emulsion of tubercle bacilli as antigen have obtained variable results, with the percentage of positive results in definite cases of phthisis, in some cases higher, and in some lower.

Object of the Investigation.

This investigation deals only with the application of the test to cases of pulmonary tuberculosis, and it was undertaken with a view to seeing if it were possible by modifications of the test to obtain results of sufficient reliability to warrant its being regarded as a specific reaction for the diagnosis of *active* tuberculosis.

The Difficulty Encountered by Previous Workers: Methods which have been Attempted to Overcome It.

In order that a reaction may be regarded as a specific test for the presence of active pulmonary tuberculosis it is necessary that a positive result should be obtained in 100 per cent. of cases definitely suffering from phthisis, or at all events in at least 98 per cent. of cases, for 2 per cent. is surely within the permissible limits of error, and at the same time no positive results should be obtained in cases definitely not suffering from tuberculosis.

The bulk of the workers on the subject are, I think, agreed that a positive result is only given in the presence of a tuberculous lesion. The difficulty hitherto encountered has been that of obtaining a sufficiently high percentage of positive results in cases known to be suffering from tuberculosis to warrant the conclusion that those cases that gave a negative result were not suffering from this disease.

The difficulty of obtaining positive results in definitely tuberculous cases has caused a doubt to be entertained as to whether the antibodies are present sufficiently constantly to make them of value for diagnostic purposes. It is certainly true that the complement fixing powers of the blood of tuberculous subjects is often infinitely less than that of syphilitic subjects, so that unless we can increase the amount of anti-substances a much more sensitive test is necessary to demonstrate their presence.

At the outset an attempt was made to increase the antibodies by administering minute doses of tuberculin (B.E.) to the patients in the hope, upon purely theoretical grounds, that tuberculous subjects would turn out more antibodies into the blood than non-tuberculous ones. As this procedure did not appear to have any effect upon the results it was abandoned. It was found, however, that the maximum amount of antibodies were present in a serum which had been allowed to remain in contact with the clot, after withdrawal of the blood from the patient for a period of 24 hours. This is in accordance with observations of Nesfield,[14] and bears out the suggestion of Metchnikoff, Danys, and Kauthack, that antibodies are formed by the leucocytes. In some of the early cases in the investigation the serum was pipetted off as soon as the blood had clotted, with a result that a negative reaction was obtained in several cases definitely suffering from phthisis, but on repeating the test, observing the precaution of keeping the serum in contact with the clot for 24 hours, a positive result was obtained.

Since it did not appear evident how the antibodies could be increased the course adopted was to make the test progressively more and more sensitive and so endeavour to detect the smallest quantities present.

The Danger of Making the Test Too Sensitive.

The danger to be encountered in making the test too sensitive is of obtaining non-specific summation effects. The blood serum of non-tuberculous individuals is capable, though in my experience to a very small extent, of causing a certain degree of fixation of complement in the presence of tubercle bacilli and so, if the test is made very sensitive, of giving non-specific effects. If all non-tuberculous sera possessed this property in an equal degree it would be a simple matter to estimate once and for all the amount of complement so fixed and add it to the minimum hæmolytic dose of complement used in the experiment. But this is not so. Some sera do not possess it at all and others to a varying extent.

The problem was to determine the maximum amount of fixation that could be due to non-specific effects and then to employ a technique whereby any fixation over and above this could be clearly demonstrated.

The Maximum Amount of Non-specific Fixation.

The results of my experiments have very definitely convinced me that this property of the blood from non-tuberculous subjects is never sufficient to fix as much as half the minimum hæmolytic dose of complement as determined in the antigen titration. Usually it is much less than this, and often absent altogether.

Method Employed of Making the Test More Sensitive.

At the outset of the investigation 2½ times the minimum hæmolytic dose (M.H.D.) of complement as determined in the antigen control was used in the experiment. When using this amount of complement 66 per cent. only of cases known to be suffering from pulmonary tuberculosis gave a positive result.

It seemed possible that although antibodies were present in the blood they were there in insufficient quantities to fix 2½ times the M.H.D., and so be demonstratedwhen using this amount of complement. So that a second series of tubes were put up, using 1½ the M.H.D. in addition to those containing 2½ times the M.H.D. By this procedure the positive results in cases definitely suffering from pulmonary tuberculosis was increased to about 90 per cent. A third series of tubes was then put up in each case, using once the M.H.D. It has already been mentioned that some sera from non-tuberculous individuals are capable of causing non-specific fixation in the presence of tubercle bacilli, and that these experiments tend to show that if we take half the M.H.D. as the maximum amount of complement that such non-specific sera can fix we are well over the possible limit that this property can reach. If, then, exactly the minimum hæmolytic dose of complement were used in the experiment anything more than 50 per cent. inhibition of hæmolysis would indicate some specific fixation and a positive result. But it is impossible in one tube only to determine the degree of inhibition of hæmolysis. All we can accurately determine is complete inhibition or complete hæmolysis. But if in addition to the tube containing exactly the M.H.D. of complement the other tube containing one and a half times the M.H.D. be employed in each experiment, then in the latter tube fixation can go on to the extent of 50 per cent. of the M.H.D. before there is any evidence of inhibition of hæmolysis in that tube, so that the smallest deposit of undissolved corpuscles would indicate some specific fixation and a positive result.

It might be argued that if any particular serum under examination had no power of non-specific fixation, and at the same time the specific antibodies present were less than sufficient to fix half the M.H.D., a negative result would be given in a definite case of phthisis. But the results of the experiments tend to the conclusion that in all cases of active phthisis specific antibodies are present in the blood in sufficient quantity to cause of themselves fixation of at least half the M.H.D. of complement, and as a rule of very much more than this.

The Reagents used in the Test.

1. *The antigen.*—The antigen used is an emulsion of live tubercle bacilli. A growth is obtained upon a glycerine potato medium prepared as follows:—

Slices of potato are cut as for the preparation of an ordinary potato medium, and put to soak for 1½ hours in a 6 per cent. solution of glycerine in water to which sufficient of a 1 per cent. solution of gentian violet has been added, so that the resultant solution shall contain gentian violet in the proportion of 1 in 6000. The potato is then removed from the solution and placed in potato tubes, the bulbs of which are filled with 6 per cent. glycerine. The tubes are then autoclaved at 115° C. for 15 to 20 minutes.

A culture of tubercle bacilli can be obtained upon this medium directly from a tuberculous sputum after treatment with antiformin in the usual way and subcultures taken from this. After the inoculated tubes have remained in the incubator for 24 hours to ensure of no contamination having taken place, the cotton wool closing the mouths is impregnated with paraffin.

Upon this medium more than sufficient growth is obtained in one tube in from 10–14 days to make up 100 c.cm. of antigen.

The advantages of this medium are that a rapid growth of tubercle bacillus is obtained, that the yellow colour of the growth is clearly differentiated from the brilliant violet colour of the medium, and that the slice of potato can easily be removed from the tube, is easily handled, and the growth can readily be scraped off the firm medium without the removal of any of the latter.

To *make up* the antigen for use, a sufficient quantity to make an emulsion of 1 in 2000 is then scraped off into a Hayden's mortar. This is thoroughly emulsified dry, three drops of fresh normal saline are then added, and after further emulsification three more drops, and finally 14 drops of saline added. The resultant emulsion is then sucked up into a pipette and placed in a flask. Sufficient normal saline to make the required dilution of 1 in 2000 is then added gradually, the mixture being thoroughly agitated after each addition. The antigen is then ready for use. This antigen *must* be made up freshly on the day of each experiment. The keeping powers of such an antigen seem to be very doubtful, and if a fresh emulsion is not used very discordant results are obtained.

The amount of antigen employed in the experiment has been kept constant at 0·5 c.cm.

2. *The patient's serum.*—5 c.cm. of blood are withdrawn from a vein in the arm and placed in a sterile test-tube. The test-tube is then allowed to stand at the room temperature for 24 hours, after which the serum is pipetted off the clot. The serum is then inactivated for one hour in a water-bath at 55° C.

Quantity of serum used in the experiment: Quantities of serum varying from one to eight drops were tried and the most constant and satisfactory results were obtained by employing four drops, so that this amount has been adhered to in all experiments.

3. *Hæmolytic amboceptor.*—This has in all cases been an antisheep serum.

4. *Blood.*—The blood in all cases has been a 5 per cent. suspension of washed sheep's blood.

5. *Complement.*—The complement is obtained from a single guinea-pig on each occasion.

Technique of the Test.

The technique employed is identical in principle with that laid down by McIntosh and Fildes for the performance of the Wassermann reaction. But at the risk of repeating much that is common knowledge, the stages of the test will be described in some detail in order to bring out clearly certain not unimportant points.

1. *Titration of the Complement.*

A dilution of 1 in 24 of guinea-pigs' serum is made. Five Wassermann tubes are taken and the diluted serum and normal saline added in the following amounts:—

	Tubes (1)	(2)	(3)	(4)	(5)
Complement (c.cm.) ...	0·05	0·1	0·15	0·2	0·25
NaCl (c.cm.)	0·95	0·9	0·85	0·8	0·75

These are then placed in a water bath at 37° C. and 0·5 c.cm. of sensitised sheeps' corpuscles added. At the end of half an hour the tubes are removed from the water-bath and the readings taken. In a majority of instances complete hæmolysis will have taken place in the third tube and either no hæmolysis or incomplete hæmolysis in the first and second tubes.

A complement of sufficiently high potency that 0.15 c.cm. of a 1 in 24 dilution of serum will cause complete hæmolysis or one of greater potency than this is satisfactory for the performance of the test. But a less potent complement than this—one, for instance, with which complete hæmolysis occurs only in the fourth or fifth tubes—does not give satisfactory results. It is especially in the last two tubes in the test, in which exactly the minimum hæmolytic dose of complement is used, that unreliable results are given if a complement of low potency is used. If, then, in titrating the complement there is no hæmolysis or only incomplete hæmolysis in the third tube the complement should be discarded and a fresh guinea-pig bled.

The necessity of using a serum whose complementing power is potent has very little practical disadvantage, as most guinea-pigs will supply a serum sufficiently potent in

its complementing power that 0·15 c.cm of a dilution of 1 in 24 will cause complete hæmolysis of 0·5 c.cm. of sensitised corpuscles, especially if particular care be taken not to employ a pregnant animal.

2. *The Titration of Complement in Presence of Antigen.*

The next stage consists in the titration of the complement in the presence of a fixed amount of antigen to determine the minimum amount of complement which will cause complete hæmolysis in the presence of antigen. The antigen as prepared in the manner described above has a definitely anti-complementary action; hence more complement is required to hæmolyse the corpuscles in the presence of the antigen than in its absence. The extent of this anti-complementary action of the antigen appears to be in direct proportion to its strength.

Five tubes are again taken and complement, normal saline, and antigen added in the following proportions:—

	Tubes (1)	(2)	(3)	(4)	(5)
Complement (c.cm.) ...	0·05	0·1	0·15	0·2	0·25
NaCl (c.cm.)	0·45	0·4	0·35	0·3	0·25
Antigen (drops)	10	10	10	10	10

The tubes are placed in a water-bath at 37° C. for one hour, and then the sensitised corpuscles added. They are allowed to remain in the water-bath for half an hour. In my experience, with an antigen of the strength above described, there will be incomplete or no hæmolysis in the last tube in which there was complete hæmolysis in the titration in the absence of antigen, but there will be complete hæmolysis in the tube next to it to the right.

That is to say, an antigen of this strength is anticomplementary to the extent of 0·05 c.cm. of complement. This titration should, however, be carried out in each experiment. The same strain of tubercle bacilli has been used in all the experiments. Whether or no different strains would be anti-complementary to a varying degree I do not know. In this way the minimum hæmolytic dose is arrived at.

In using the term minimum hæmolytic dose one is only speaking relatively when working with differences of 0·05 c.cm. of complement. That is to say, if there were complete hæmolysis in the fourth tube and incomplete hæmolysis in the third the actual minimum hæmolytic dose lies somewhere between 0·2 and 0·15 c.cm. of complement. This suggested that it might be advisable to get nearer to the true M.H.D. by working with finer differences of complement. So that a series of experiments were done, using differences of 0·025 c.cm. of complement between each tube. Experience proved, however, that, although by this means one could get nearer to the true M.H.D.—0·175 c.cm., say, instead of 0·2 c.cm.—differences of 0·05 c.cm. were sufficiently fine for practical purposes.

3. *The Test.*

For each serum to be examined six Wassermann tubes are taken. The antigen, patient's serum, complement, and saline are added as follows:—

	Tubes (1)	(2)	(3)	(4)	(5)	(6)
Patient's serum (drops)	4	4	4	4	4	4
Normal saline (drops)	10	—	10	—	10	—
Antigen (drops)	—	10	—	10	—	10
Complement (c.cm.)	0·5*	0·5*	0·5†	0·5†	0·5‡	0·5‡

* Containing 2½ M.H.D. † Containing 1½ M.H.D. ‡ Containing 1 M.H.D.

Tubes 1, 3, and 5 are, of course, the controls. All tubes are well shaken and placed at the room temperature for three-quarters of an hour. They are then transferred to a water-bath at 37° C. for three-quarters of an hour. At the end of this time the sensitised sheep's blood is added. The tubes are then left in the water-bath for a further half-hour and then removed and the readings taken.

Reading the Results.

Bearing in mind what has already been said with regard to the maximum amount allowed for non-specific fixation, the reading of the results will be quite simple.

Occasionally, for some reason I am unable to explain, it may require a little longer than half an hour for complete hæmolysis to take place in the controls containing the highest dilution of complement. But an extra five minutes or so in the water-bath will effect complete hæmolysis, and this does not in any way vitiate against the reliability of the results, for as much as an hour or an hour and a half will not bring about hæmolysis in any tube in which there is true specific fixation. In a very strongly positive result there will be no hæmolysis at all in tubes 2, 4, and 6.

In a less strongly positive result complete hæmolysis may have taken place in tube 2, but little or none in tube 4, and none in tube 6.

In the least strongly positive of all there will be complete hæmolysis in tube 2, and there may be very considerable hæmolysis in tube 4, but, and this is the most important point of all, the hæmolysis in this tube will not be complete, there will always be some turbidity of the fluid, indicating that more than half the M.H.D. of complement has been fixed; in the sixth tube there is usually no hæmolysis, and always less than 50 per cent.

In a negative result there will usually be complete hæmolysis in all the tubes, but in a certain number of cases the hæmolysis in tube 6 will not be complete, but the hæmolysis in tube 4 is always complete. The tubes are then placed in an ice chest over night and the readings verified in the morning.

In a positive result there will always be some undissolved corpuscles collected at the bottom of tube 4.

In the tables below the following plan of recording the results has been adopted.

If there appeared to be complete or over 50 per cent. of inhibition of hæmolysis in the second tube, with complete inhibition in tubes 4 and 6, the result is recorded as +++. If there appeared to be no inhibition of hæmolysis or under 50 per cent. in tube 2, but over 50 per cent. in tube 4, the result is recorded as −++. A result recorded as −−+ signifies that there was less than 50 per cent., but always some inhibition of hæmolysis in tube 4.

Up to the present it has not been possible to discover any obvious correlation between the strength of the reaction given and either the extent of the disease, its duration, or its probable clinical course. Some early cases and some advanced cases have given a strong reaction, other early cases and other advanced cases have both given a positive reaction in the highest dilution only, and cases apparently doing well have given both strong and weak reactions in different instances, as have cases apparently progressing rapidly.

It follows from this that the first two tubes in which 2½ M.H.D. is used could be omitted from the experiment. But they have been and are still being retained partly for the sake of comparison of the later with the earlier results and partly in the hope that careful study of the subsequent history of each case may reveal some prognostic or other significance in the strength of the reaction that does not at first sight seem evident.

Results.

The investigation extended over four stages. Stage 1 was purely experimental, and no results were recorded. In stage 2, 2½ M.H.D. only of complement was used. In this stage 66 per cent. of cases having tubercle bacilli in the sputum gave a positive result. In stage 3, 2½ M.H.D. and 1½ M.H.D. were used, and 90 per cent. of cases having tubercle bacilli in the sputum gave a positive result. A detailed consideration of these results would be of no value, as the percentage of positive results in cases known to be suffering from pulmonary tuberculosis was not sufficiently high to warrant any conclusion being drawn from the negative results.

In stage 4, 2½, 1½, and 1 M.H.D. were employed in each case, and the results thereby obtained will now be considered in detail.

Classification of Results.

For the purpose of classification the results have been placed in four groups.

Group 1, in which tubercle bacilli had been found in the sputum at the time of performance of the test.

Group 2, in which tubercle bacilli were found in the sputum subsequent to the performance of the test.

Group 3, other cases giving a positive result.

Group 4, cases giving a negative result.

Stage 4.—In which three dilutions of complement were used—namely, 2½ M.H.D., 1½ M.H.D., and 1 M.H.D. as determined by the antigen control.

Group 1.—In which T.B. were present in the sputum at time of test (Table I.).

Group 2.—In which T.B. have been found in sputum subsequent to performance of complement-fixation test (Table II.).

Group 3.—Other cases in which T.B. had not been found in the sputum up to the time of writing this report in which a positive reaction was obtained in one or more dilutions of complement (Table III.).

It must be appreciated that in a considerable number of the cases in this group the test has been performed within the last month or so, and there can be no doubt that in many of them T.B. will be found in the sputum at a subsequent date. All the cases in Table II. were at one stage in this table, and the former table is rapidly increasing at the expense of the latter. The sputa of

the cases in this group are, of course, being examined when present at regular intervals for the presence of T.B. In some cases the disease may have become arrested, as is probable in No. 38.

TABLE I.

No.	M.H.D. 2½	1½	1	No.	M.H.D. 2½	1½	1	No.	M.H.D. 2½	1½	1	No.	M.H.D. 2½	1½	1
1*	−	+	+	14	+	+	+	27	0	+	+	39	−	+	+
2*	−	−	+	15	−	+	+	28	+	+	+	40	−	+	+
3*	−	−	+	16	+	+	+	29	−	−	+	41	+	+	+
4*	−	+	+	17	+	+	+	30	−	−	+	42	+	•	+
5	0	+	+	18	−	−	+	31	+	+	+	43	+	+	+
6*	−	−	+	19	−	+	+	32	+	+	+	44	+	+	+
7*	−	+	+	20	+	+	+	33	+	+	+	45	+	+	+
8	+	+	+	21	+	+	+	34	+	+	+	46	+	+	+
9	−	+	+	22	+	+	+	35	+	+	+	47	+	+	+
10	−	−	+	23	+	+	+	36	+	+	+	48	+	+	+
11	−	+	+	24	+	+	+	37	−	+	+	49	+	+	+
12	0	+	+	25	+	+	+	38	+	+	+	50	−	+	+
13†	−	−	−	26	−	+	+								

* These cases were done previously in lower dilutions of complement and with negative results.

0 signifies that there was insufficient blood sent for all dilutions. All cases, therefore, in which T.B. were present in the sputum at the time of examination of the blood gave a positive result save one (No. 13).

† Case 13.—This was a case which was diagnosed a bronchiectasis, and which had all the typical symptoms and physical signs of this condition. But on the third routine examination of the sputum T.B. were said to be present. The sputum has been examined frequently since, but the presence of T.B. has not been confirmed. So that it is reasonable to assume an error on the third routine examination.

TABLE II.

No.	M.H.D. 2½	1½	1	No.	M.H.D. 2½	1½	1	No.	M.H.D. 2½	1½	1	No.	M.H.D. 2½	1½	1
1	+	−	0	7	+	+	+	13	+	+	+	19	−	−	+
2	−	−	+	8	+	+	+	14	+	+	+	20	+	+	+
3	−	+	0	9	+	+	+	15	+	+	+	21	−	+	+
4	+	+	+	10	+	+	+	16	+	+	+				
5	−	−	+	11	+	+	+	17	+	+	+				
6	−	+	+	12	0	+	+	18	−	+	+				

Group 4.—Other cases giving a negative result in all three dilutions. Of these there were 92. Examining these cases in detail their condition is shown in Table IV.

Summary of Results in Stage 4.

Group 1.—If we exclude Case 13, on the grounds that the finding of tubercle bacilli in the sputum was an error, 100 per cent. of the cases having T.B. in the sputum at the time of performance of the test gave a positive result.

Group 2.—100 per cent. of cases in which T.B. were found in the sputum subsequent to the performance of the test had given a positive result.

Group 3.—There appears to be a reasonable conformity between the positive results in this group and the clinical condition of the patients. In a majority of the cases there were present either symptoms or physical signs or both, strongly pointing to the presence of an active tuberculous lesion in the lung or pleura. In many such symptoms and physical signs were sufficiently marked to constitute a clinically certain case of tuberculosis. This group will, of necessity, be continually decreasing at the expense of Group 2. For in many of the cases included in Table III. the test was performed quite recently when the sputum had only been examined once or in some cases before the sputum had been examined at all.

Group 4.—There appears, also, a reasonable conformity between the negative results in this group and the clinical condition of the patients. Many were definitely suffering from diseases other than tuberculosis, some were healthy individuals, and in none were the physical signs and symptoms present which would constitute a clinically certain case of phthisis, save, perhaps, in Case 82, Table IV., in which a positive Wassermann reaction was present and the possibility of syphilis of the lung has to be considered.

Special Points Suggested by the Results.

1. *Persistence of antibodies in the blood after arrest of the disease.*—In Cases 26 and 38 (Table III.) a positive result was obtained. In neither of these cases were T.B. present in the sputum, nor were there any definite physical signs or symptoms pointing to active disease, but in both T.B. had been found in the sputum at a previous date. In Case 38 records were obtainable which proved beyond a shadow of doubt that the patient

TABLE III.

No.	M.H.D. 2½	1½	1	Clinical condition.
1	−	+	+	Physical signs of hydropneumothorax.
2	−	+	+	Phys. signs of fibrosis left apex and excavation left base. Child of 11.
3	−	+	+	Phys. signs of almost complete excavation of left lung. Onset. of pulm. tub. 47 years ago. T.B. in sputum frequently. None on 2 exams. recently.
4	+	+	+	Recent hæmoptysis. Dullness, bronchial breath sounds, crepitation, &c., both apices. Sputum not obtained.
5	−	−	+	Rhonchi all over chest and (?) fine crepitations rt. apex. Week later bronchitis much less and definite pleuritic rub rt. base.
6	+	+	+	Pleural effusion. No sputum.
7	0	+	+	Acute pleurisy 5 months ago. Signs of thickened pleura now.
8	−	+	+	Pleural effusion. No sputum.
9	−	+	+	Child of 11. Diagnosed (?) chronic pulm. tub. Dullness, crepitations, &c., rt. apex. Also (?) cong. syphilis. Wass. reac. neg.
10	+	+	+	At time of test recent hæmoptysis. No a.p.s. A month later definite phys. signs of pulm. tub. and extensive disease confirmed by X rays. No sputum.
11	+	+	+	Impaired note bronchial breath sounds and crepitations at rt. apex. Pyrexia.
12	−	+	+	Impaired note, bronchial breath sounds, crepitations, &c., rt. apex. No sputum.
13	+	+	+	Impaired note, prolonged harsh expiration and definite crepitations detected when out-patient; cleared up after stay in hosp. Still under observation as out-patient.
14	−	−	+	No a.p.s. Night sweats, loss of weight, and irreg. pyrexia.
15	+	+	+	Dullness, bronchial breath sounds, and crepitations, both apices.
16	−	−	+	No a.p.s. Recent hæmoptysis of 4 oz. No sputum.
17	−	+	+	No a.p.s. Loss of weight. Difference of 3° between morning and evening temp. below normal line. Not settling down on prolonged rest in bed.
18	−	+	+	No a.p.s. Loss of weight, considerable hæmoptysis 10 days prev. T. 99·2° F.; P. 124.
19	−	+	+	Dullness, crepitations, &c., rt. apex. Sputum blood-stained. Diag. clin. as pulm. tub.
20	−	+	+	Pneumonia, followed by pleurisy and hæmoptysis, 1916. Hoarse voice, night sweats. Lost 2 st. in two years.
21	−	+	+	Onset following "flu.," 1918. Impaired note, crepitations, &c., rt. apex. Diag. clin. as pulm. tub.
22	−	+	+	No definite a.p.s. Considerable loss of weight.
23	−	−	+	Dullness, crepitations, &c., rt. apex. Pyrexia. Diag. clin. as pulm. tub.
24	+	+	+	Impaired note, crepitations, &c., rt. apex. Hæmoptysis, loss of weight.
25	−	+	+	Impaired note, crepitations, &c., over whole of lt. lung, also over apex of rt. lung. T. 101°; P. 120. Sputum frequently streaked. Diag. clin. as pulm. tub.
26	−	+	+	Said to have had T.B. in sputum 2 years ago. Not present now. No definite a.p.s.
27	+	+	+	Dullness, crepitations, &c., rt. apex. Sputum streaked with blood a week ago. Emaciation.
28	+	+	+	No definite a.p.s. Lost 1½ st. in 2 years.
29	−	+	+	Diag. clin. as C.P.T. in 1905. T.B. not present in sputum. Definite signs then and now. Dullness, distant bronchial breathing and crepitations over upper two-thirds of lt. lung.
30	+	+	+	Phys. signs of bronchitis, stated he had lost 1 st. 2 lb. in 2 years, still losing weight. Has lost 7 lb. in 2 months while under observation as out-patient.
31	−	−	+	No a.p.s. when first seen. Hæmoptysis week prev. Cough for few weeks. Week later numerous crepitations at rt. apex.
32	−	+	+	Impaired note at both apices. Fine crepitations all over lt. lung and at apex of rt.
33	−	−	+	Pleurisy 6 weeks prev. Coloured sputum 6 weeks ago. Loss of weight, night sweats. Fine crepitations rt. apex diag. clin. as pulm. tub.
34	+	+	+	Impaired note and crepitations, &c., rt. apex. Diag. clin. as pulm. tub.
35	+	+	+	Acute pleurisy rt. base.
36	−	+	+	Impaired note crepitations, &c., rt. apex. sputum blood-stained. Diag. clin. as pulm. tub.
37	−	+	+	Pleurisy 1915 and 1918, and at present. Blood in sputum 5 weeks ago. Impaired note both apices and crepitations rt. apex.
38	+	+	+	T.B. present in sputum in 1916 and 1917; absent now. No a.p.s. now. Regarded as case of arrested phthisis.
39	+	+	+	Impaired note, crepitations, &c., rt. apex. Diag. clin. as pulm. tub.

No a.p.s. = No abnormal physical signs in chest.

TABLE IV.—*Cases Giving a Negative Result in Three Dilutions of Complement.*

No.	Clinical condition.
1	Syphilis. Blood sent for Wass., which was + ve.
2	Signs of bronchitis. No a.p.s.
4	Melanotic sarcoma of foot.
5	Epithelioma of cervix of uterus.
6	,, ,, ,,
7	Cancer of uterus.
8	? Hydatid of lung at time of test. Operation subsequently showed new growth.
9	Bronchitis and asthma.
10	No a.p.s.
11	,,
12	Signs of bronchitis; said to have had early pulm. tub. 25 years ago. No T.B. found in sputum.
13	No a.p.s. Diag. neurasthenia.
14	No a.p.s.
15	,,
16	Syphilis. Wass. reac. + ve.
17	No a.p.s. Very bad fam. hist. of pulm. tub. Looks ill.
18	No a.p.s.
19	,,
20	,,
21	Bronchitis and emphysema.
22	Diag. pulm. tub. by Pensions Med. Board. Been to sanatorium. No a.p s. Sputum T.B. – ve 9 times.
23	Hæmoptysis some years ago. Attending gen. hosp. several years. No T.B. ever found in sputum. No a.p.s.
24	No a.p.s. Said to have had T.B. in sputum 16/10/19. Absent several times since.
25	Signs of bronchitis. Child of 11. No sputum.
26	Debility. No a.p.s.
27	Impaired note bronchial breath sounds rt. apex. No moist sounds. Had cough during winter, none now.
28	Small hæmoptysis year ago. No a.p.s.
29	No a.p.s.
30	,,
31	No a.p.s. Swinging temp. 97° to 99° F.
32	Signs of bronchitis and emphysema, fine pleural rub over rt. side.
33	Had been to sanatorium 1913. Fine creps. ? pleural angle of rt. scapula. General condition good. No constitutional symp. now. No T.B. in sputum.
34	Cough. Sputum streaked with blood on several occasions. No a.p.s.
35	Impaired note and weak breath sounds rt. base.
36	Impaired note and fine crepitations rt. apex.
37	No a.p.s.
38	Loss of weight. No a.p.s.
39	Small hæmoptysis 6 months ago. No a.p.s.
40	Signs of emphysema.
41	Small hæmoptysis. No a.p.s.
42	Small hæmoptysis 1916. No a.p.s.
43	No a.p.s.
44	Blood sent for Wass., which was neg.
45	No cough, expectoration, or hæmoptysis. Crepitations at rt. base.
46	No a.p.s.
47	Sputum streaked with blood previously. No a.p.s. No sputum now.
48	Said to have had pulm. tub. 16 years ago. No a.p.s. now.
49	Wounded in chest. Impaired note rt. base and faint breath sounds. X ray suggests pleural adhesions.
50	Bronchitis and emphysema.
51	In-patient in Brompton Hosp. Aug., 1918. Not diag. No a.p.s. Very thin. Clubbing of fingers. ? diag.
52	Signs of cavity rt. apex. Offensive sputum. T.B. – ve 5 times. Diag. apical bronchiectasis.
53	No a.p.s.
54	Former in-patient Brompton Hosp. No a.p.s., then or now.
55	Diag.: "Chronic mouth-breather and traumatic kyphoscoliosis."
56	Bronchitis, emphysema, and asthma.
57	Bronchiectasis and emphysema.
58	Syphilis. Blood sent for a Wassermann reaction (+ve).
59	No a.p.s.
60	Bronchitis.
61	,,
62	No cough, expectoration, or loss of weight. Hæmoptysis estimated by patient at 1 pint month ago.
63	Bronchitis. Blood sent for Wass. (–ve).
64	No cough, expectoration, or hæmoptysis. States loss of weight. No a.p.s.
65	T.B. said to have been found in sputum outside, neg. five times as in-patient. No a.p.s.
66	Bronchitis and emphysema. History of pulm. tub. 11 years ago.
67	No a.p.s.
68	No a.p.s. States loss of weight.
69	Phys. signs indefinite; crepitations at rt. apex, which cleared up. Clubbing. Very little cough or expectoration now.
70	No a.p.s. Cough for 6 months.
71	No a.p.s. now. Bronchitis on and off since childhood. Diarrhœa and vomiting now.
72	Bronchitis and asthma.
73	Emphysema.
74	Bronchitis for 3 years.
75	Hæmoptysis 3 years ago. No a.p.s. then or now.
76	Has scattered crepitations at both bases.
77	No a.p.s. Had bronchitis in 1917. Loss of weight.
78	Said to have had T.B. in sputum 1914 on one occasion. Never confirmed on several exams. since. No a.p.s. then or now.
79	Gunshot wound of chest.
80	Pleurisy rt. base.
81	No a.p.s.
82	? Syphilis of lung. Dullness bronchial breath sounds. Râles, &c., over rt. upper and lower lobes and lt. upper lobe. Sputum repeatedly – ve for T.B. Wass. reac. pos.
83	No a.p.s.
84	,,
85	,,
86	No symptoms, only a.p.s. were ? a few fine crepitations at rt. apex.
87	Slight cough. No sputum. Impaired note and weak breath sounds lt. apex.
88	No a.p.s. No sputum.
89	No a.p.s. No sputum. Diag. "debility."
90	Child of 11. Cough "always." Pneumonia 5 times. No a.p.s. now.
91	No cough or sputum. ? hæmoptysis Jan., 1920.
92	Diag. "fibrosis of lt. lung, ? cause." Girl of 18.

was in 1916 and 1917 suffering from active pulmonary tuberculosis. On clinical grounds it would appear at present to be a case of arrested pulmonary tuberculosis. In the other case the evidence was not quite so conclusive, but it was definitely stated that T.B. were present in the sputum on one occasion at least.

The peristence of antibodies in the blood after the arrest of the disease is in conformity with what we know of immunity in other pathological states, and it will be a point of interest to follow up such cases to determine the duration of such persistence of antibodies in tuberculosis. This consideration does not in any way affect the reliability of the test as a means of diagnosis of active tuberculosis if it be borne in mind that a positive result indicates the presence of a tuberculous lesion which is active at the present time or has been so within a recent date.

2. *The significance of a positive reaction.*—The above results do not support the view that the presence and intensity of the reaction is in any way dependent upon the actual size of the lesion, for a positive reaction is obtained apparently in the very earliest stages of the disease, before the appearance of physical signs by which we may estimate the size of the lesion, but when presumably it is very small. But it is definitely upon the present or recent activity of the lesion that the presence of the reaction depends. The alleged tuberculous infection in early life, which has been used as an explanation of the large percentage of positive results obtained in adults by the von Pirquet reaction, does not cause a positive complement-fixation reaction to be given.

3. *The bearing of the results upon the serological uniformity of the human type of tubercle bacillus.*—The possibility of the existence of several "types" of the bacillus is at present fully appreciated, and much statistical evidence has been collected recently by Dr. J. Brownlee which appears to support this view. But in so far as these experiments have any bearing upon this question the results appear strongly to support the view of the serological uniformity of the human type of the tubercle bacillus.

Conclusions.

The conclusions to be drawn from these results are:

(1) That in the complement-fixation test we have a specific means of diagnosis of the presence of an active or recently active tuberculous lesion.

(2) That a negative reaction is as reliable an indication of the absence of such a lesion as a positive reaction is of its presence.

(3) That a positive reaction in the highest dilution only of complement is just as reliable an indication of the presence of such a lesion as a positive reaction in all three dilutions.

In conclusion, I wish to express my great appreciation for the assistance that my colleagues, Dr. L. S. Burrell and Dr. A. Hope Gosse, have given me in carrying out this work, not only in helping to supply me with material, but also in giving me the value of their opinion on the clinical condition of those cases under their care.

I should also like to thank the other members of the visiting staff of the Brompton Hospital for their permission to make use of the cases under their care, and the residents at the hospital for their assistance.

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(*Continued at foot of next page.*)

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF DEFECTIVE SLEEP-SHUNT.

BY E. W. SCRIPTURE, M.D.

ONE of the conditions that render sleep possible is the shutting off or shunting of the impressions from the senses. The mechanism is often very efficient. Many people can sleep in the bright sunlight, or close to a railway, or on the hard ground. Most people are not disturbed by daylight in the bedroom, by crowing cocks, or by hard beds. The following case of defective mechanism is perhaps a rare one.

The patient, a man over 50 years of age, as far as his memory goes has suffered as he does now. He is awakened by the first light of dawn. The rattling of a window, a step in the hall, a word spoken in a neighbouring garden, a bird on a distant tree, or any other slight noise will wake him. The pressure of his body on the bed produces, after about 10 minutes, painful sensations that oblige him to turn from one side to the other all night. The sensations from the digestive organs produce constant nightmares. He has been told by various doctors to take bromides or veronal, to drink much beer, to change his diet at night, to put up with the condition as he seemed to keep healthy under it, to stop letting his imagination play the fool with him, and so forth. He has tried all these methods, singly or in combination. Bromides have little effect; veronal was considered dangerous. The beer cure worked excellently in Munich; three pints of lager produced a pleasant sleep with no headache or drowsiness in the morning. A single glass of English beer, however, gives him a disturbed sleep and a muddled head for the day after. Eating produces dreams; starvation wakes him up. An attempt at the attitude of resignation produces a most doleful mental outlook. He underwent a long treatment by hypnotism, with some improvement. Psychanalysis did not achieve much. He has been forced to rely on his own devices for protection, and he has developed a number of defences. He always sleeps in an attic room with a window away from the road. When travelling he gets a room on the top floor at the back. He wears a special blinder at night made of a silk band stuffed with down; this fits pleasantly and tightly over the eyes. To counteract the joint sensations he formerly used a number of small down pillows packed around the feet and knees. He can now dispense with them by sleeping directly between blankets on a very soft bed.

The defence against noises has been especially difficult. The natural thing would be to stop up the ears. The difficulty lies in finding a substance that is dense enough to keep out the sound and yet so comfortable that the ears do not feel it. Although Ulysses sealed the ears of his sailors with wax when about to pass the sirens, no one seems to have followed up his idea. The antiphones devised before or during the war were hard, uncomfortable substances that could not fit the ears properly; soft things let the sound through. For 30 years this man has experimented with different kinds of wax and similar compounds. The best kind he finds to be the ordinary hard paraffin used for microtome mounts. A pellet held in the fingers soon becomes soft. Placed in the ear it seals it tightly and yet remains so soft that it is not felt.

The condition remains unexplained. One might consider it a reversion to ancestral type of the period when the savage could sleep in safety only if the slightest alarm would wake him. Or it may be that the sleep-shunt mechanism received some injury in early life; the psychanalyst probably has a suggestion ready.

New Cavendish-street, W.

(Continued from previous page.)

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A CASE OF ECLAMPSIA IN MIDDLE PREGNANCY, TREATED BY VAGINAL HYSTEROTOMY; RECOVERY.

BY ALECK W. BOURNE, M.B., B.CH., F.R.C.S.ENG.,
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ECLAMPSIA is a disease not uncommonly met with in the latter weeks of pregnancy, but it is a decidedly rare complication of middle pregnancy. In my patient it occurred at the twenty-fourth week, and this fact, together with other unusual features, has prompted me to record the case.

Mrs. S., a primigravida, was admitted to Queen Charlotte's Hospital on July 28th at 6.30 P.M. The history obtained was that she was quite well until June, when vomiting became severe, associated with swelling of ankles. This cleared up and she was well again until July 26th, two days before admission, when she suddenly developed a severe headache, with stabbing pains in the right eye. This continued during the 27th, and in the afternoon of the 28th she is said to have had three fits. No account of previous renal disease or zymotic infection could be obtained.

On examination she was found to be in a very restless, noisy condition, requiring restraint, and was quite irrational. She presented the appearance of cerebral irritation, following a head injury. The fundus uteri reached the lower border of the umbilicus, and the last menstruation was stated by relatives to have occurred in January. Temperature was 97·6° F., pulse 108, and blood pressure 135 (a dose of veratrone, ½ c.cm., having been given prior to admission to hospital).

There was slight œdema of the legs and face, and the colour was fairly good, without cyanosis. The bladder contained 12 oz. of urine, which gave the following analysis: sp. gr., 1024—reaction, acid; urea, 1·5 per cent.; chlorides, 0·16 per cent.; ammonia, 0·097 per cent.; acetone, nil; diacetic acid, nil; albumin, 0·035 per cent.; deposit—epithelial cells, leucocytes, numerous granular casts.

Having regard for the serious prognosis of eclampsia at so early a date of pregnancy, I decided to evacuate the uterus as soon as the bowel had been thoroughly washed out. Morphia, 1/6 gr., was given to control the restlessness, but no further dose of veratrone was given, as the blood pressure remained at 135 mm. At 8.45 P.M. I performed vaginal hysterotomy by the usual procedure of reflecting up the bladder above the internal os and making a single incision up the anterior wall of the uterus. Version was done and the fœtus easily extracted by the breech. The placenta and membranes having been removed, the incision was sutured with chromic catgut. As hæmorrhage was severe and the uterus remained lax during the insertion of the sutures, 1 c.cm. of pituitrin was given and the uterus douched. The fœtus weighed 1 lb. 6 oz. and was 10 in. long.

During the night, ten hours after delivery, the sister reported a fit, and the blood pressure had risen to 175 mm., for which ½ c.cm. of veratrone and ¼ gr. of morphia were given. The blood tension fell to 156 by 7 A.M. and later to 135 and 140, at which level it remained permanently. There were no more fits, but the patient remained in a restless irrational condition all the next day (29th), but regained complete consciousness on the 30th. A trace of albumin remained until August 10th, but the convalescence was uninterrupted, the temperature never reaching 100° F. The lochial discharge was scanty and disappeared early.

The patient was discharged from hospital on the eighteenth day.

Remarks.

In an analysis of the frequency of eclampsia at different periods of pregnancy Petersen[1] gives the incidence of the disease at the fifth month as only 8 cases in 499, or 1·6 per cent. Among these 8 cases there were no deaths, but among 29 cases occurring at the sixth month the mortality was 34·5 per cent. All the patients were treated by vaginal hysterotomy.

The prognosis of eclampsia in early pregnancy is undoubtedly more serious than in late pregnancy, and it is probable that radical treatment will yield the best results, but at the fifth and sixth months rapid evacuation of the uterus is a different problem from that which obtains at term.

At the end of pregnancy, abdominal Cæsarean section offers a safe and rapid method, but when the height of the fundus reaches only to the neighbourhood of the umbilicus the vaginal route alone should be considered. Evacuation by dilatation and digital manipulation can be an extremely difficult and prolonged operation, involving danger to the patient from anæsthetic poisoning, shock, and hæmorrhage. Vaginal hysterotomy, however, can be finished in half an hour or less; it involves no tearing of the internal os, there is ample room for the removal of fœtus and placenta, and the uterine incision is accessible and easy to suture. For cases which require rapid evacuation of the uterus before the seventh month this operation gives the quickest method, together with the minimum of trauma and shock.

[1] Petersen: Trans. Am. Gyn. Soc., 1911, vol. xxxvi.

Reviews and Notices of Books.

ANIMAL EXPERIMENTS AND SURGERY.

Hunterian Lectures delivered in February, 1920. By WALTER G. SPENCER, M.S., F.R.C.S. University of London Press, Ltd. 1920. Pp. 180. 6*s*. net.

Mr. Walter G. Spencer's Hunterian lectures on Animal Experiments and Surgery have been recently published in a small book, which should make instructive reading both for surgeons and for the wider public interested in surgical progress. The matter in the lectures was originally gathered in the course of combating the Bill for preventing experiments on dogs, which was laid before Parliament in the summer of 1918 and was eventually defeated. The lectures do not, however, savour of propaganda. The first in the series seeks to present in historical sequence the chief experiments on animals on which the steps in the progress of surgery have been founded; the second describes those experiments which were directed towards the application of surgical methods to the treatment of the individual structures of the body, and includes the transfusion of blood and infusion of various fluids into the circulation, operations on the heart and vessels, anastomosis of the intestine and the treatment of intestinal obstruction, and operations on other abdominal organs; the third deals with more recent refinements in surgery, such as operations on the nerves, brain, ductless glands, and kidneys, and the discoveries upon which is based the treatment of various infective disorders.

To those surgeons who have been content to remain in ignorance of the early history of their craft it will probably come as a surprise to find how much of the pioneer work in surgery was done by Galen in the second century A.D. This writer is chiefly remembered as an anatomist, the account of his numerous original experiments being scattered through his anatomical treatises, and so having been generally overlooked. Yet Galen, whose name is often a catchword for dry antiquarianism, was the originator of surgical operations on the great vessels, heart, brain, bladder, and ureters, as well as being an expert investigator of muscular function and of localisation of function in the brain and spinal cord. On many occasions he defeated the incredulity of opponents by his use of the experimental method, employing for his object various animals, such as dogs, pigs, goats, and monkeys. For centuries all surgical teaching was based on his discoveries, and in several cases the full import of his work was not realised until quite recent years.

The next great experimenter on animals was Vesalius, who, working in the first half of the sixteenth century, supplemented the discoveries of Galen and greatly extended knowledge of physiology and surgery. Some of his most striking experiments were on the heart and lungs, and he was probably the first surgeon to expand a lung artificially after the thorax had been opened. A number of investigators, notably in Italy, followed up the impetus given to experimental research by Galen and Vesalius, and the development of medical science spread by this means to England, Holland, and Denmark during the seventeenth century. In Germany during the eighteenth century Albrecht von Haller was the leading exponent of the value of experiments on animals, but his surgical diffidence was remarkable. "Although entrusted," he wrote, "with a chair of surgery for seventeen years, and although I have frequently given surgical demonstrations, I have none the less never borne to cut a live man lest I should do too much harm." At the same time progress by experiment was going on in England and France, so that in the nineteenth century surgery was able to enter on a new phase, culminating in the discoveries of Pasteur and Lister. Mr. Spencer has, however, found it necessary to emphasise the fact that after the time of Astley Cooper experimentation was much neglected in England, so that we fell behind France and Germany in our knowledge and skill. The statement by Erichsen in 1874 that "surgery has attained its highest plane and reached its limit of usefulness" appears to have typified the English attitude at that time, though fortunately during the years that followed complacency gave way to progress, due largely to the work of surgeons, such as Horsley and MacEwen.

At the conclusion of his first section Mr. Spencer has rightly drawn attention to the handicap under which surgeons in Great Britain labour in being forbidden to acquire manual skill by means of practice upon animals. Horsley did his best to overcome this in his evidence before the Vivisection Commission in 1907, but without avail. The direct consequence of this is that most surgeons have to acquire their manipulative experience chiefly at the expense of their patients, since it cannot be maintained that operations on the dead body, even if there were to be extended facilities for these, are of much value in the acquisition of technical skill. Mr. Spencer mentions, as outstanding instances of this unsatisfactory state of affairs, the performance of tracheotomy on a child, of the radical cure of a hernia in a baby, and of operations on the eyeball, all of which might readily be learnt by practising on anæsthetised animals. Almost the whole range of abdominal surgery might be included in the same category, and the technique of the surgery of the chest, which is still in its infancy, might sooner reach maturity were British surgeons granted the same opportunities that were enjoyed by Galen 1800 years ago.

It is apparent from the brief summaries contained in Mr. Spencer's second section that very few advances in surgery have been made without the aid of preliminary experiments on animals. The first successful cholecystectomy was performed on a dog by Zambeccari in 1680; splenectomy, though practised by the ancients, was not established as a feasible operation until 1872, when Mosler thoroughly investigated the results of the operation in rabbits. Similar instances, too numerous to mention here, are to be found in Mr. Spencer's book; his excellent summaries should be of great service in the future to the trustees of research, and they will also be used for reference by those interested in the historical aspect of the various branches of surgery.

INFECTIOUS DISEASES.

A Practical Text-book. Second edition. By CLAUDE BUCHANAN KER, M.D., F.R.C.P.Edin., Medical Superintendent, City Hospital, Edinburgh, &c. London: Henry Frowde and Hodder and Stoughton. (Oxford Medical Publications.) 1920. Pp. 628. £2 2*s*.

As ten years have elapsed since the appearance of the first edition of this text-book it may not be amiss to note the exact scope of the work. The title might lead to the expectation of a considerably wider field than is actually covered by the author, who confines himself to the diseases commonly met with in public infectious hospitals in the British Isles. Indeed, in the present volume we find that the one rare disorder dealt with in the former edition, relapsing fever, has been omitted. Cerebro-spinal fever finds a place, but not acute poliomyelitis. A somewhat remarkable omission is that of influenza, which has so recently demonstrated its gravity as an infectious disease.

The first chapter of the book is devoted to a general consideration of infection, immunity, and fever. We note that the author now tends to accept the existence of a connexion between the incubation period of a disease and the phenomena of anaphylaxis suggested by us in a former review of this work. He also admits some scepticism as to the value of the ordinary processes of disinfection of rooms after outbreaks of infective fevers, and notes that equally good results are obtained by simple cleaning and ventilation. The later chapters deal with the individual diseases, and the author has maintained the practical point of view adopted in the former edition, and has only discussed the bacteriology, or rather parasitology, of the affections so far as is necessary from the clinical aspect. It is, indeed, noteworthy that the common specific fevers remain an *opprobrium pathologiæ* in so far as their exciting causes are still unknown. When these are identified, much of the difficulty at present

experienced in distinguishing between measles, rubella, and scarlatina will in all likelihood be a thing of the past, whereas so long as diagnosis depends on mere cutaneous manifestations, it will always remain uncertain, and the question of the existence of some fourth or fifth closely allied affection will admit of no definite answer. In the book before us the author keeps an open mind as to the reality of Dr. Clement Dukes's fourth disease, but considers the evidence so far adduced unconvincing. As an empirical aid to diagnosis Dr. Ker has seen good results in using the Rumpel-Leede test for scarlatina—the production of small petechial spots by application of a fairly tight bandage round the arm. On the other hand, he notes that the Widal test is unreliable as a means of distinguishing typhus from typhoid, as it may often be found positive in the former malady—a somewhat curious condition, as there seems no reason to attribute typhus to any organism related to the *B. typhosus*. In the section on diphtheria we find that tracheotomy is still regarded by the author as preferable to intubation in private cases, as medical aid may not be immediately available if the tube is coughed up. He discusses the value of active immunisation with toxins as a prophylactic for this disease, but there seems little scope for this method in view of the efficacy of a preventive dose of antitoxin in the presence of an epidemic; the latter procedure does not induce the risk of a preliminary negative phase, which seems theoretically probable after an injection of a toxin or vaccine.

We can cordially recommend this book as a useful practical guide to the treatment of infectious fevers in these islands. It embodies the ripe experience of an observant physician, adequately supplemented by a study of recent contemporary literature.

CUNNINGHAM'S MANUAL OF PRACTICAL ANATOMY.

Vol. III. Seventh edition. Head and Neck. Revised and edited by ARTHUR ROBINSON. London: Henry Frowde and Hodder and Stoughton. 1920. Pp. 568. 12*s*. 6*d*.

THIS is the remaining volume of an edition which we have already noticed, and is a worthy companion of the two other members. The illustrations are again outstanding features, and include many radiographs. The three volumes make a beautiful and complete work of reference, possibly more suitable for functioning in that capacity than for the needs of the average student, who has little time to loiter in the pleasant by-ways of anatomy.

THE TREATMENT OF SYPHILIS.

By H. SHERIDAN BAKETEL, A.M., M.D. New York: The Macmillan Company. 1920. Pp. 167. 13*s*.

THE author gives a clear account of the treatment of syphilis, with special regard to intravenous medication, the technique of which is too often neglected in text-books. This deficiency Dr. Baketel has remedied by his detailed account of the methods employed in the clinics under his charge. The standard the author sets is a high one. Whilst it affords an ideal at which every syphilologist should aim, we must confess that the time demanded for the carrying out of the excellent technique described by Dr. Baketel makes it difficult of attainment in many of the overworked and understaffed clinics of this country.

A clear and interesting précis of the history of arsphenamin is given in the opening chapters. Dr. Baketel traces the progress of arsenical medication from the days of atoxyl, and gives a brief account of the chemistry of arsenic compounds. Methods of administering mercury and iodides are also described. In the later chapters the treatment of congenital, visceral, and nervous syphilis is discussed, as also the question of reactions and accidents following the use of arsphenamin. Finally, the difficult subjects of cure and of marriage are approached. With regard to the latter, the author lays down the rule that no man should be allowed to marry until repeated examinations of blood and cerebro-spinal fluid have demonstrated that the spirochætes have been absolutely eliminated from the system. "A man with a positive Wassermann, even though it be caused by an aortitis or a lesion of the spinal cord, should not marry or endeavour to procreate."

The book is well illustrated, and every step in the procedure of intravenous injection can be followed in the plates. It is altogether an excellent guide to anyone desirous of attaining a good technique in the treatment of syphilis.

AIDS TO OSTEOLOGY.

Second edition. By PHILIP TURNER, B.Sc., M.B., M.S., F.R.C.S. Students' Aid Series. London: Baillière, Tindall, and Cox. 1920. Pp. 187. 4*s*. 6*d*.

AS a concise summary of the main facts in human osteology this little book is a good member of the series to which it belongs. It will, doubtless, prove of value to the ordinary student who wishes to revise the subject of "bones" before an examination. A large amount of information is compressed into a small space; the descriptions are formal, and the English nomenclature is used. We must point out, however, that Albrecht's suggestions about the ossification and formation of the premaxilla are discredited, and the modern teaching of the development of the maxilla and mandible differs from that given in this book.

DUTIES OF SISTERS IN SMALL HOSPITALS.

By FELICE NORTON. London: Baillière, Tindall and Cox. 1920. Pp. viii. + 75. 4*s*. 6*d*.

THE practical experience gained in a small hospital may be a priceless asset in a nurse's career, but whether this is so or not depends largely on the tact, efficiency, and ethical standard maintained by the sisters in it. Miss Norton's book may serve as a model to those upon whom the training of probationers devolves. The author has incorporated within the limits which she has set herself sound and practical advice, and we recommend her injunctions to every nurse who is about to assume the responsibilities of a sister's post.

X RAY ATLAS OF THE SYSTEMIC ARTERIES OF THE HUMAN BODY.

By H. C. ORRIN, O.B.E., F.R.C.S. Edin. London: Baillière, Tindall, and Cox. 1920. Pp. 92. 12*s*. 6*d*.

THE author has devoted a large amount of time and ingenuity to the production of the very beautiful plates which form the basis of this book, and he has demonstrated the possibility of injecting, for X ray work, even the smallest arterial branches; this is particularly well seen in the photograph of an adult hand. The work, as a whole, was done on a fœtus owing to difficulty in procuring an adult cadaver. While admitting at once the clearness and value of the plates, the success of the author's methods, and the interest of the relations thus brought out between the vessels and the skeleton, we nevertheless confess that this sort of work seems to us to be of relatively little value from an anatomical standpoint. The plates show nothing that is not known and taught by the usual methods; in fact, they necessarily show an incomplete picture. Surgically the relations between bones and vessels are not by any means the only important ones, and X ray work, so far as it goes at present, cannot give an adequate idea of the relations existing between the arteries and the soft parts. We doubt whether the mere demonstration of continuity between vessels is, from an anatomical point of view, of importance sufficient to outweigh the absence of all those other "relations" which make up a knowledge of the anatomy of the arteries; there is a tendency at present to magnify the value of X ray work in anatomy, and to allow it to assume in this subject a position to which it has no justifiable right. This said, we can commend without further reserve a book which could be placed with advantage in the hands of a student together with his ordinary anatomical manuals. The letterpress accompanying the plates is a concise summary of distributions and branches.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 25, 1920.

Post-Graduate Medical Study.

A FEW weeks ago our Vienna correspondent wrote of a series of post-graduate lectures to be delivered in that city during the present summer months, covering the whole range of medical and surgical knowledge and open to medical graduates of all countries. He added that English readers would be interested to learn that American doctors were coming to Vienna and that a considerable number of them had already booked places for the approaching winter term. Our readers will therefore be not unprepared for the item of news which Mr. GEORGE E. MACLEAN, director for England of the American University Union in Europe, communicates to our correspondence columns. A committee in Chicago has organised an excursion for physicians to go to Vienna for study in the way that American physicians were accustomed to do before the war. No one, we think, can grudge the improvement in economic conditions which makes it just possible for professors and tutors to keep themselves from starvation by giving of their best to medical brethren from other lands; least of all this country, which, next to America, has contributed so largely to the rehabilitation of its Austrian colleagues. A multitude of grateful pupils will welcome any sign that medicine begins to feel its feet again in Vienna.

But this is not to say that post-graduate medical study on the continent of Europe will have the same easy pull over the attractions provided in this country that it had a decade or two ago, when the continental habit was formed. Everything points the other way. The arrangements for medical education in this country are changing like a kaleidoscope, and the alteration would be astounding to anyone who could picture vividly the difference between the mental pabulum and the facilities offered in 1920 and those of 1900, when post-graduate instruction had practically not come into being. Hardly a week now passes without the announcement in our columns of some new and attractive object of study for those who have obtained a legal qualification. Last week it was a course for general practitioners to be given at St. Andrews under the direction of Sir JAMES MACKENZIE; the issue before it was a post-graduate week at Oxford in early October to be addressed by Sir ARCHIBALD GARROD and Professor G. DREYER. Successful post-graduate courses have been conducted during the past year at Glasgow, Sheffield, Birmingham, Manchester, and other university centres. It is the gracious task of the Fellowship of Medicine, associated with the Post-Graduate Medical Association, to be the centre of exchange for all existing facilities and for others as they come into being. It should be a matter of common knowledge that a Fellowship ticket costing four guineas a month entitles the holder to attend the clinical practice, including practical demonstrations and laboratory work, at the 12 great London medical schools and at 25 special hospitals in the metropolitan area. The weekly bulletin of the Fellowship contains a time-table which shows at a glance where and by whom the classes and demonstrations are given. It is, of course, an essential condition of a successful ticket office, on the one hand, that the functions for which tickets are issued should actually take place, and, on the other, that when they do take place visitors should be present in sufficient numbers to justify the trouble which the performers have taken. Complaints on both these scores have reached us from time to time. During the holiday season especially it is natural that teachers of distinction should not be found at their posts, but it has happened—and it should not happen—that fixtures announced in the bulletin have not taken place. Other demonstrations arranged with care and forethought have remained practically unvisited. It is easier to see and regret these difficulties than to avoid them. In any case they are but the ripples on the surface of a great volume of arrangements satisfactory alike to teacher and taught.

It is in this respect that the continental plan of a special and detailed scheme of post-graduate study in all its branches has an apparent advantage. Such courses in Vienna are arranged solely and entirely for the convenience of graduate students. Patients are brought from all parts of the city to a central clearing-house, where they are classified and arranged without any particular consideration for the human material. Medicine is not tending that way in this country, where teacher, student, and patient form a trio, each of whose needs is considered and subordinated if need be to those of the others. The continental plan, as we may briefly call it, does away with the social and economic setting of the patient, a factor of ever-growing interest and importance. It would be quite possible to build up such a system in London, and when it was done it would resemble the annual view-day, which is such a travesty of normal hospital routine. We offer a word of encouragement to those who have suffered from the minor inconveniences of sight-seeing. The sights are there right enough, but each student must be content to be in a measure his own cicerone. His reward will be that when he gets there he sees the real thing and not a puppet-show. The Fellowship of Medicine is on the right lines in following an indigenous plan. Development is proceeding. The attachment to each medical school of a complete post-graduate scheme with clinical assistantship appointments for practitioners is undoubtedly the ideal to be aimed at, and will come in the fullness of time. The concentration of post-graduate teaching around some of the new clinical units in our London schools is, as our special article last week indicated, becoming an actual reality. Further opportunities will naturally grow out of the work in hospitals and clinics now steadily being created throughout the country. Soon we shall have nothing to fear from comparisons.

End-results in Nerve Injuries.

Sir WILLIAM THORBURN concluded an introductory address to the Section of Surgery at the annual meeting of the British Medical Association with the words: "If a surgeon obtains 50 per cent. of really good economic recoveries after secondary nerve suture he is doing well; if he obtains 75 per cent. of such recoveries his work is both brilliant and fortunate." A careful study of his address, which appears in our present issue, shows that he did not himself look at the picture of nerve surgery through rose-coloured glasses; and, in

view of the many patients attending hospital at the present day after nerve suture, it is clear that his reservations are justified. The question which indeed arises is whether Sir WILLIAM THORBURN is himself not optimistic—whether his "50 per cent. really good economic recoveries" is possible of realisation, in consideration of the severity of gunshot injuries of nerves. It is everyday experience that after suture of the musculo-spiral nerve such a recovery rate may be anticipated, and an approximate but lesser degree of recovery after operation on the sciatic nerve, but the observed results after suture of the median, and more especially the ulnar, nerves seem to show that the surgeon must be both brilliant and fortunate to obtain such good numerical results. Few branches of surgery require more anatomical knowledge and greater specialised skill than nerve surgery. The results hinge on detail—cleanliness, hæmostasis, delicacy in handling the nerve itself, and an exact knowledge as to how the attendant difficulties (and there are many) are to be overcome. Some of the unfavourable results may be due to want of this exact skill and knowledge. The busy surgeon is still apt to regard the case as finished when the stitches are out, regardless of the fact that the preliminary stage alone is completed. But even after making such allowances we must admit that, with the exception of the musculo-spiral and sciatic nerves, the results of secondary nerve suture are disappointing. Before the war the idea was prevalent that end-to-end suture was, when possible, desirable. We know now that end-to-end suture must be striven for in the face of all prevailing difficulties. It is the one method which may give a reasonable, perhaps good, functional result. All other methods, in spite of some few successful cases reported, are disappointing. We fear that an investigation of cases under treatment at the various London hospitals at the present time would show that our less sanguine views are justified. It may be argued that the patients attending orthopædic and electro-therapeutic centres are merely the failures, but unquestionably many who are there are striving to obtain a better economic result. It should be clearly borne in mind that a patient suffering from a divided nerve of the size and nature of the median or sciatic is economically useless, and the operator would be wise to study nerve surgery in all its details before he advises and carries out operative procedures. We would add also that all those who are interested in nerve surgery would benefit greatly by studying the many cases of nerve injury attending the out-patient departments of pensions hospitals.

Wilhelm Wundt, 1832-1920.

WILHELM WUNDT was born near Mannheim in 1832. He first devoted himself to the study of medicine, becoming privat-dozent in physiology under HELMHOLZ in Heidelberg at the age of 26. Two years later he published his Theory of Sense-perception, this forming his first approach towards philosophy, to which he had hitherto paid as little attention as does any ordinary student of medicine. This contribution sketched out a programme for the experimental treatment of psychology that WUNDT afterwards did so much to foster. Hitherto experiments bearing on this youngest of the children of philosophy had been made exclusively by physiologists for physiological purposes, or in the case of FECHNER for its psycho-physical interest. Under the stimulus of HELMHOLZ'S great works on hearing and vision WUNDT'S psychological studies led to his lectures on the human and animal mind (1863), in which he made his first reference to the bearing of ethnology on psychology. The first edition of his Physiological Psychology appeared in the following year. After a brief activity in Zurich as professor of "inductive philosophy," WUNDT was called to Leipzig, where he remained till his death. As he declared in his introductory lecture there, his constant effort was to construct a unitary vision of the world in all its aspects, but—unlike many philosophies of the past—in constant affiliation with the methods and results of all the sciences. In view of the then recent collapse of the Hegelian philosophy, which presumed to construct the universe and all its history out of the self and its logic, that effort showed a wise restraint, calculated to restore philosophy to its due place of honour among the mental and spiritual products of man's urge towards thought. But if the source and methods of previous German philosophy were thus abandoned, the range and bulk of production taken by its professor as an ideal of attainment was rather increased. WUNDT traversed the whole field of philosophy in long works of numerous volumes, as well as in countless papers in journals. His Physiological Psychology reached its sixth edition in three large volumes in 1908. His Logic appeared in 1880–83, and reached its third edition in three volumes in 1906. There are besides: Ethics, 1886—third edition, two volumes, 1903; System of Philosophy, 1889—third edition, 1907; Anthropology, in six volumes, from 1900 on—now in second and third editions; The Sensuous and Supersensuous World, 1914. His output was enormous.

The first institute of experimental psychology was founded in Leipzig by WUNDT in 1879. From it proceeded a great number of the senior professors of psychology of the present day. In America his pupils are specially numerous, of whom TITCHENER has perhaps come nearest to the stature of his teacher. The work of WUNDT'S laboratory is conserved in his "Philosophische Studien", and in the following "Psychologische Studien," as well as in journals. WUNDT'S psychology embodied the results of these investigations, far too exclusively indeed, as prominent German psychologists have admitted. His exposition was practically a psychology of the Leipzig studies, which have too often failed to stand the test of rigorous examination. STUMPF, the foremost exponent of the psychology of hearing, made short work of their efforts in audition. For this reason WUNDT'S labours in psychology have had less influence than their bulk would suggest. The citadel of his laboratory was so built that for most travellers at least the gate of orthodoxy was the only road to graduation or study. That, of course, is so universal as almost to be inevitable in what is called a school in philosophical circles, and psychology has not shaken free of this pernicious tradition. In his effort to make all the sciences—natural, mental, and logical—converge to form an approximately and temporarily complete philosophical system WUNDT'S philosophy has gained the greatest respect, and is on the safest lines, however striking the efforts of one-sided extremists may be—when they are successful. The man who stakes his all on a conviction risks total obscurity for the chance

of progress and immortality, while enormous mediocrity can at most oppress us only until the sciences roll us away from it. Some of WUNDT'S colleagues have compared him, as a mind uniting in itself all the knowledge of its time, with ARISTOTLE or LEIBNITZ. But there was not in him anything so unique and distinctive as there was in LEIBNITZ. The thought of centuries will hardly be compelled to focus itself on WUNDT for one of its characteristic and insuppressible synthetic possibilities.

WUNDT was of pleasing and gracious personality. His style of lecturing was objective and plain, his conversation courteous and direct. He was severely abstemious, living solely for intellectual capacity. His lectures were crowded to the limits of the auditorium, as he was an outstanding feature for all Leipzig students. The year 1914 was a difficult time for a philosopher. To the regret of those who knew him, the intellectual conscience that had often allowed his zeal for production to outrun his care for exactitude and his fair judgment permitted WUNDT to write about the spirit of British and French philosophy in a way calculated to bring them into contempt. France had sold her soul for honour, England for money and social power, while Germany alone was striving for an ideal. Even NIETZSCHE was cited as a witness. Thus did philosophy fail the octogenarian philosopher.

Annotations.

"Ne quid nimis."

WAR-ADAPTED ASYLUMS.

THE History of the Asylum War Hospitals in England and Wales, presented as a report to the Home Secretary by Sir Marriott Cooke and Dr. C. Hubert Bond (H.M. Stationery Office. Price 9*d.*), sets forth the services rendered to the wounded and sick during the war by the asylum authorities throughout England and Wales under the direction of the Board of Control. During 1915, from certain selected asylums the insane patients were removed and the institutions so vacated were adapted, equipped, and organised as general medical and surgical military hospitals. The scheme when fully developed supplied 24 hospitals which, without exception, were acknowledged by all the many expert authorities, military and civil, and other competent judges who inspected them to have afforded facilities for treatment in all respects equivalent to those available at the best military and civil hospitals in the country. These 24 hospitals provided, with some hutments, as many as 27,778 permanent beds; and when the extension by camps and the temporary beds used in times of special pressure are taken into consideration, could accommodate over 31,000 patients. The number of patients treated in them to the date of this report has been 482,949, approximately equivalent to one-sixth of the total number of sick and wounded men from all fronts during the war. The selection of asylums was based upon the principles that they should be of comparatively modern construction and suitable for use as general hospitals; that they should be accessible by rail and in proximity to large towns where physicians and surgeons should be readily available; that the asylums should be arranged, according to their geographical situation, in nine groups, and that from among each group one asylum should be converted into a war hospital, while the other asylums in the group should receive all the insane patients belonging to the vacated asylum; and that although the insane patients might suffer some inconvenience, the receiving asylums might for the time be overcrowded to the extent of 20 per cent. of their normal accommodation. In the short space of a few weeks the nine asylums had been cleared of their insane patients, excepting a few who were to carry on the farm work or who were too ill to move. This rapid transference of some 12,000 patients, including many dangerous and violent cases and many who were aged and feeble, was effected without any untoward incident. It is sad, but consoling, to learn that many of the patients exhibited sorrow on being obliged to leave institutions which had, in some instances, been their homes for years, and that the mutual regret shown by patients and by members of the staffs on parting was pathetic.

The adaptation, equipment, and organisation of the asylums as war hospitals were undertaken by the visiting committees of the several vacated asylums, as well as the collection of the requisite additional staff and the carrying on of the business side of the administration of the hospital, including the settlement of contracts for the supply of food and necessaries for patients and staffs. The adaptation included the removal of everything in the buildings which might have been objectionably reminiscent of their normal purpose, the provision of operating-rooms, of X ray apparatus, accommodation for additional staff and stores, and occasionally the alteration of roads to provide easier access for ambulances. In the matter of the staffs the medical superintendent became officer commanding and administrator; the senior assistant medical officer became the registrar and usually acted as deputy to the officer commanding; the other assistant medical officers, ineligible for foreign service, or not as yet released for it, were given posts on the medical staff of the hospital. Where the matron had had full training in a general hospital she was made matron of the hospital. All the asylum nurses, however great their experience in nursing bodily illness among insane patients, were classed as probationers, and had to work—sometimes in wards of which they themselves had had charge—under the sisters and trained hospital nurses, a trying position for them. To the male asylum attendants was given the orderly work in the wards and elsewhere in the hospital, as well as the duty of acting as male nurses when necessary. The services of the best operating surgeons and physicians in the locality of each hospital were secured as visiting surgeons and physicians, while to the surgical and medical divisions of the hospital were appointed a chief resident surgeon and a chief resident physician.

As the war went on the original number of nine hospitals was added to, and ultimately 24 asylums and kindred institutions were being used as military hospitals, one of them as an United States Base Hospital. In addition to the enormous number of physically sick and wounded patients the large total of 38,440 patients suffering from mental breakdown or nervous diseases had up to May 1st, 1920, been treated either in a section of one or other of the war hospitals or in the seven smaller hospitals, most of which were established later on, and from their inception devoted exclusively to the treatment of soldiers suffering from mental and nervous complaints. Of the 24 hospitals, 17 have now been closed down, and of the hospitals still in operation probably all but four will have closed by the end of this year.

The asylum authorities and officers have a right to look back with satisfaction on the splendid work they were able to do for the country in general, and the sick and wounded in particular, at a time of urgent need.

THE FLUCTUATION OF SCARLET FEVER.

CONSIDERABLE attention has been drawn during the past few weeks in more than one journal to the annual summary issued by the Ministry of Health in respect of the number of notifications in each sanitary district of a variety of infectious disease. Interest has been riveted particularly on two diseases—scarlet fever, the prevalence of which, after an appreciable increase in 1913 and 1914, showed a remarkable decrease in 1917 and 1918, followed by a rise in 1919; and diphtheria, which after some increase in 1914 and 1915, showed no similar reduction in the later war

years. A variety of suggestions have been offered in the public press to explain these perplexing variations in one disease and the equally perplexing contrast with the other common infectious disease, the control of which is commonly regarded as no more difficult than is that of the former. Was the drop in the incidence of scarlet fever in the later years of the war the result of the war, in some way which cannot at present be defined—possibly, for example, by the diminution in the crowding of children, by the transfer of the men to camps and of many women to the residential quarters connected with munition works? Was the incidence of scarlet fever affected by some variation in the prevalence of fleas, which have been suggested by one well-known medical officer of health as a possible channel of infection? One phenomenon, however, appears to have been ignored in many of the comments on this vagary of scarlet fever—that is, the fact that there is a cyclical variation in the prevalence of most of the acute infectious diseases, which was formerly recognised from study of the records of deaths, and which can now to some extent be noted in the national statistics of notifications, which have been collected year by year since 1911. The statistics of incidence, as apart from mortality, do not extend back for a sufficient number of years for the curve of varying prevalence to be clearly indicated. The figures of incidence both for scarlet fever and for diphtheria given by the Registrar-General do, however, distinctly suggest such cyclical variation, and it appears reasonable to assign to the factors behind these normal variations a large responsibility for the low rates of incidence of scarlet fever in 1917 and 1918, which appear to correspond to the trough of the wave between 1914 and the next maximum, possibly to be attained in 1920 or 1921. This in itself is obviously not an explanation of the phenomenon, and no explanation of the changing cycles of prevalence can yet be given, though doubtless some part is played by a variety of known influences. Among these may be mentioned variations in the susceptibility of the population to infection, the susceptibility increasing and approaching steadily towards the point of explosion as the period from the previous outbreak lengthens. Again, it is conceivable that there may be a periodic alteration in the virulence of the organism causing the infection. It is further recognised that the degree of prevalence of the infectious diseases is closely bound up with variations in the conditions of soil and air—variations in the level of underground water, in the earth temperature, and in air humidity. We still await the wide and detailed exposition of the true bearing of these and other influences on the prevalence of the infectious diseases. Meanwhile, we can happily yet proceed, in the hope of an appreciable measure of success, with the business of curbing their capricious visitations.

CHRONIC SEPTIC SPLENOMEGALY.

IN his first Lumleian lecture on the War Experiences of a Physician, printed in THE LANCET of Sept. 11th, Sir John Rose Bradford described an obscure and rare disease of which he had seen two, possibly three, instances. This malady was characterised by a febrile illness having considerable resemblance to enteric fever and lasting several weeks, during which the spleen slowly increased in size to a dimension comparable to that reached in ordinary spleno-medullary leukæmia. Indeed the cases presented considerable likeness to this disease, but differed, in that, after an illness of many weeks, the pyrexia declined, and the spleen slowly returned to normal. Sir J. Rose Bradford states that the nature of these cases is obscure; certain tropical affections could all be excluded, and the search for parasites was negative. They may, however, bear relationship to some cases recently published by Dr. Gordon Ward[1] under the title of "Chronic Septic Splenomegaly." From the large group of splenic anæmias he separates these cases into a class the ætiology of which is not specific, but which, according to him, is well recognised in American literature. The condition may follow the invasion of any of a large number of organisms, but there is reason to suppose that the streptococcus is most frequently responsible, and the primary foci of invasion are usually the intestines, pelvic organs, and nasal cavities. According to Dr. Ward, the cases described in medical literature fall under the following groups: (*a*) Egyptian Splenomegaly, described by Richard and Day, Archibald, Nicolle, &c.; (*b*) Endocarditis Maligna, described by Parkes Weber, Riesman, &c.; (*c*) Oral Sepsis with Splenomegaly (Essex Wynter); (*d*) Enteritis with Splenomegaly (Hollins); and (*e*) others associated with bacillary dysentery, parametric abscess, dental sepsis, and infection of the antrum. The diagnosis is not difficult: blood examination excludes leukæmia, there is no jaundice, nor are there enlarged lymphatic glands. Splenic puncture excludes kala-azar, Gaucher's disease and malaria, while Wassermann's reaction excludes syphilis. Five cases are described by Dr. Ward, in which there was enlargement of the spleen associated with dysentery, parametric abscess, and infection of the antrum of Highmore, the enlargement disappearing when these conditions were cured. In Sir J. Rose Bradford's cases blood examination revealed a condition similar to that seen in splenic anæmia, a diminution in the number of red cells, and a considerable leucopenia, the white count falling to 3000. Dr. Ward gives a very fully detailed account of the blood examination in his five cases. The number of red cells varied between 2,825,000 and 6,670,000, and the leucocytes between 3200 and 17,800; nucleated red cells were rarely seen; polychromatophilia was constant, but by no means marked. This difference in the blood examination seems to us rather striking, and further evidence will be necessary before deciding that Sir J. Rose Bradford's cases and those of Dr. Ward come under precisely the same category.

[1] Archivos de cardiologia y hematologia, May-June, 1920.

PHARMACO-ENDOCRINE THERAPY.

AN official report of the twenty-first annual meeting of the American Therapeutic Society, held at the College of Physicians, Philadelphia, last May, has just reached us, from which it is evident that the presidential address, by Dr. Charles E. de M. Sajous, of Philadelphia, was of more than passing interest. It was in effect a powerful plea for renewal of interest in the science of therapeutics, which appears to be suffering from neglect in America at the present time. His main argument may be briefly recapitulated.

The salvation of therapeutics would depend, in Dr. Sajous's view, upon the degree of curative efficiency it could be made to attain. If the pharmacologist concentrated his efforts upon its main purpose, the cure of disease, by studying the influence of drugs upon our defensive functions, he would stimulate endeavour on all sides. Great confusion in experimental endocrinology and the lack of agreement among workers in this field had led Dr. Sajous to work independently, seeking what light clinical and experimental data might throw upon the subject. His views, derived from the clinic, were often in disagreement with those of physiologists and pharmacologists. With regard to the adrenals, in his opinion clinical experience with the human subject did not bear out the statements of physiologists that therapeutic doses of adrenalin had an inhibitory effect on the functions of the gastro-intestinal canal; in fact, the effect was often quite the opposite. The supposed blood pressure-raising power of adrenalin also proved misleading. Indeed, one of his workers found that if there was one thing that adrenalin *did not* do it was to raise blood pressure.

Dr. Sajous's studies, in accordance with those of other workers, had convinced him that absorption of oxygen from the air in the pulmonary alveoli necessitated in the pulmonary circulation some substance capable of actually appropriating this gas. It was suspected that this substance was some kind of internal secretion, and clinical studies in over one hundred diseases pointed to the adrenals as the source of this secretion, which, after entering the vena cava and passing through the right heart, finally reached the pulmonary alveoli with the venous blood. Here it probably became part of the hæmoglobin, converting it into oxyhæmoglobin. Considerable evidence, both direct and indirect, showed that the adrenal secretion influenced general oxidation and metabolism, increasing the intake of oxygen and the output of carbon.

dioxide. The adrenin present in the hæmoglobin was taken as the real measure of adrenin in the blood—not what the adrenal bodies secrete, which might be nil under normal conditions and excessive under excitement or stimulation. Dr. Sajous suggested that pharmaco-endocrinology might be studied in this connexion as having a bearing on the manner in which drugs influence the functional activity of the ductless glands. If, therefore, with some drug one could enhance the action of the adrenals one could, at will, increase not only respiratory activity but also tissue metabolism, the foundation of all functions. Strychnine he considered the most active suprarenal stimulant. Others existed, such as cocaine in small doses, and digitalis and quebracho were partial excitants of adrenal activity, caffeine, tea, and coffee also possessing this power when used in moderation. Having discussed adrenal stimulation, Dr. Sajous turned to the question of how to control excessive activity of the adrenals. Various disorders, sexual, muscular, and cutaneous, were traceable to hyperadrenia. This caused in some cases a pseudo-type of high blood pressure, due to excessive constriction of all arterioles, thus producing arterio-sclerosis. The antagonists to this hyperfunction of the adrenals were the nitrites. Persistent hyperadrenia was the cause of the high blood pressure in those cases termed pseudo-angina pectoris, and nitrites combined with dietetic regulation rapidly removed this disorder.

Another potent resource at the disposal of therapeutics was the thyroid gland, with its influence on the katabolic phase of metabolism in the breaking down of fats and soft tissues. A further function preeminently attributable to the thyroid was its immunological activity, so active at times that it destroyed not only bacteria and their toxins but the tissues themselves. The over-active thyroid was indeed capable of destroying both body and mind. Dr. Sajous stated that in dementia præcox the phosphorised cerebral cell fats had been katabolised by the thyroid hormone secreted to destroy the pathogenic agent, usually of intestinal origin. In hypothyroidism, on the other hand, the patient was highly sensitive to infections and succumbed promptly thereto unless protected by thyroid therapy.

The influence of drugs on the thyroid gland, Dr. Sajous concluded, would have to be studied in regard to the body's defensive functions. The iodides, by stimulating the activity of the thyroid gland, added to the body's antitoxic and bactericidal functions. Besides the iodides, calomel, in very small doses—not more than 1/12 gr.—was a powerful defensive agent. Given in these quantities calomel, by its thyro-activation, had been effective in checking epidemics of diphtheria, probably by increasing the flow of antibodies in the blood. Such examples sufficed to illustrate the resources of pharmaco-endocrinology. Excitants of the ductless glands could be used to abort disease by stimulating antibodies, and depressants of these organs could be used to check exuberant activities which destroyed both mind and body. Organo-therapy indicated the influence of endocrines upon morbid processes; and pharmaco-endocrine therapy revealed their true importance as weapons against disease.

Dr. Sajous has himself made important contributions to the subject of which he writes, and his views demand attention. In an appeal for the endowment of a Chair of Pharmacology at St. Mary's Hospital Medical School, it is pointed out that there is only one complete pharmacological institute in London, and even this is dissociated from any hospital. The neglect of the systematic study in this country of the therapeutics of the endocrines by recognised pharmacological methods is probably also in large degree due to the difficulties of standardisation. When these have been surmounted—and the matter is under the present consideration of a committee appointed[1] last May by the Minister of Health—the study of endocrinology may be expected to attract fresh attention and important results may ensue.

INFLUENZAL MASTOIDITIS.

THROUGHOUT last winter and spring, but especially during the spring months, there occurred an abnormal number of cases of acute otitis media in which the sequence of nasopharyngeal infection and infection of the middle ear has been obscure or so foreshortened in time that the otitis has been the first observed occurrence. The extreme virulence of the otitis has been remarkable in many of these cases, so that some of them have appeared septicæmic almost from the first hour, and nearly all have shown a quite abnormal degree of intoxication. Where a definite catarrh has been present it has been of that febrile type which constitutes, when epidemic, an "influenza." The bacteriology of the middle-ear process is streptococcal. A precocious involvement of the mastoid has been common, and has often been discovered before there were any evidences of mastoid infection clinically, the case being explored simply on the strength of the patient's very grave general condition and the otitis. It has been remarked in addition that where the initial stages of the otitis were got through without mastoid exploration there has still been an unusual proportion of cases in which the continuous presence of profuse discharge, often without any other sign, has led to the exploration of the mastoid and the discovery of extensive infection and pus formation. In our issue of July 31st (p. 241) Mr. F. F. Muecke and Dr. C. Grantham-Hill described a number of these milder cases of symptomless "influenzal mastoiditis." The absence of obvious signs of mastoid suppuration, leading in many cases to delay of operative treatment, has, however, occasioned a quite unusual proportion of the graver intracranial complications. A recurrence of otitis media of this severe type is probable during the coming winter months, and it will be necessary to keep the matter in mind if the occurrence of unnecessary catastrophes is to be avoided. The indications for operation, judging by last year's experience, should be, firstly, the presence of grave general intoxication in any case of acute otitis media; second, the persistence of profuse discharge even without any obvious malaise and in the absence even of any mastoid tenderness or periosteal thickening. In nearly all such cases a valuable indication of suppuration in the antrum will be found in the swelling of the periosteum and integument of the deepest part of the postero-superior part of the wall of the bony external meatus. Where this condition is present the mastoid should be opened without delay.

GASTRIC POLYPOSIS.

ACCORDING to Dr. Ernest S. Du Bray,[1] of the University of California, who reports an illustrative case, confirmed cases of gastric polyposis are comparatively uncommon. He suggests that some of the vague and obscure conditions of the stomach which have been diagnosed as chronic gastritis or gastric neurosis may, on further investigation, prove to be examples of benign tumours of the gastric wall. The term "gastric polyposis" includes adenomas, fibromas, lipomas, and papillomas, which may all form polypoid tumours, in which sometimes the connective tissue predominates and at other times the glandular elements. The most important primary benign tumours of the stomach are polyadenoma and papilloma, the others being extremely rare. Nothing definite is known about the cause of gastric polyposis, but it is frequently associated with other diseases, such as gastritis, hypertensive cardio-vascular disease, and syphilis. It is commonest in men past middle age. There are no pathognomonic symptoms, although there are sometimes suggestive evidences of the disease. Clinical manifestations depend principally on the size, position, and nature of the growth, and especially on its relation to the pyloric end of the stomach. Non-pedunculated masses on the greater curvature may remain latent or more commonly produce vague epigastric symptoms, followed by a desire to belch and eventually to vomit. The symptoms do not appear to have any relation to meals. The vomit contains an excessive amount of mucus, in which, as in Meyer's case, a polyp may sometimes be found and enable a pre-operative diagnosis to be made. There is usually achylia gastrica or hypo-acidity. Pedunculated and less commonly non-pedunculated growths near the pylorus may prolapse and give rise to partial or complete pyloric obstruction. Hæmorrhage due to the great vascularity of the tumours is frequent, but remains long unrecognised. Occult blood will be found in the fasting contents of the stomach and in the stools. The general nutrition, weight, and blood picture are less affected, as a rule, than in

[1] THE LANCET, 1920, i., 974.

[1] Archives of Internal Medicine, August 15th, 1920.

carcinoma. Generally speaking, palpable masses are commoner in those cases in which the growth is large. Long duration of the symptoms with little or no change in the patient's general health is strong evidence against the presence of malignant disease and should suggest the possibility of a benign tumour. Dr. Du Bray's case occurred in a man, aged 48, who had a history of epigastric pain and belching with loss of weight of six months' duration. Apart from epigastric tenderness, physical signs were negative. The absence of free hydrochloric acid in the gastric juice and the presence of occult blood in the stools, together with the fluoroscopic picture, which showed a large, clear-cut defect in the greater curvature, suggested a diagnosis of gastric carcinoma. Exploratory laparotomy revealed a broad-based papillomatous tumour in the greater curvature of the stomach. The tumour was excised, and the patient when seen six months later had had no recurrence of his symptoms.

THE PROPERTIES OF SERPENT VENOM.

WE have in the *Tropical Diseases Bulletin*, issued under the direction of the honorary managing committee of the Tropical Diseases Bureau, a useful and practical Centralblatt in a branch of medicine of steadily growing importance. The August number of the *Bulletin* contains a review of a series of papers recording the results of exhaustive investigations on the properties of serpent venoms. The details were published by B. A. Houssay, J. Negrette, and A. Sordelli in the Review of the Institute of Bacteriology (Buenos Aires), and deal chiefly with American species of serpents, while including also Australian, Asian, and one European species. The action on carbohydrates, fats, and lecithin of certain venoms was first investigated. These venoms are summarised as having no amylolytic action and as being almost inert, with one exception, against neutral fats, but as saponifying lecithin with evidence of a strong hæmolytic power. This ability to split lecithin is favoured by salts of calcium and by normal serum, and may either be thermolabile, or thermostable to a varying extent. These venoms also curdle milk; their properties are lost by filtration, by agitation with animal charcoal, and by heating (70° C.), and slightly impaired by horse-serum. Though the respective antivenines are specific they are to a certain extent congeneric. The varying action on proteins of the same venoms is then discussed. The proteolytic action is much weaker than that of trypsin, and is not exercised on solid proteins, except on fibrin in the presence of salt water. The proteolytic venoms generally retard coagulation by heating; they alter and then hydrolyse the proteins of serum, change dissolved casein so that it is no longer precipitated by acetic acid, and liquefy gelatin. The proteolytic property is distinct from the coagulant, agglutinative, toxic, and hæmolytic properties. The special diastatic properties of various organs and tissues of *Lachesis alternatus* have been investigated in detail and a certain amount of lecithinasic (or fat-splitting) and amylolytic action has been discovered in most of them; the pancreas and liver alone show a weak inversive power and a weak lipolytic action on oil. No proteolytic action could be demonstrated in these tissues. The venoms of two Australian species, *Pseudechis porphyriacus* and *Notechis scutatus*, and two Indian species, the cobra and Russell's viper, have no amylolytic action, but a lecithinasic action which was at first diminished, then augmented, and finally attenuated on heating progressively from 50° to 100° C. Cobra venom has some slight action on olive oil, and curdles milk and liquefies gelatin very feebly. The venom of Russell's viper also curdles milk feebly. Strong doses of cobra venom favour heat-clot of normal horse-serum, and watery solutions of horse-serum and of the red corpuscles of the horse are precipitated by concentrated solutions of cobra venom. As regards the specific action of venoms upon the blood, of the 17 venoms tested 11 are described as coagulant and 6 as anticoagulant. Experiments in vitro show that the phase of coagulation influenced varies widely; for example, the proteolytic venoms act on fibrinogen and may render it incoagulable, while others impede the alteration of thrombin. The special phenomena of coagulant venoms in vitro, the effects of different physical and chemical conditions in modifying those phenomena, and the interaction of toxin and antitoxin have also been studied. The times of clotting have not been found to vary parallel with the quantities of venom. Excessive doses of these coagulant venoms prevent clotting by altering the fibrinogen, and it is thus necessary to experiment with progressive doses of venom. Salts, particularly oxalates, impede the clotting, as also does peptone. Mammalian plasma is more easily clotted than that of birds, reptiles, and batrachia. The clotting constituents of the venoms are filtered with difficulty, do not dialyse, resist alcohol, are precipitated by ammonium sulphate, and destroyed by potassium permanganate. Progressive heat either gradually diminishes the power of the venoms, or, more often, causes a sudden and marked diminution followed by recuperation. Antitoxic plasmas and serums are highly but not rigidly specific. There is not, so far as can be seen, any oppugnant principle between anticoagulant and coagulant venoms; the difference between them depends upon the action of the anticoagulant venoms upon fibrinogen. Experiments in vivo, most successful on the dog, show that in coagulant venoms the clotting is directly due to precipitation of fibrinogen by the venom itself. This "positive phase" is succeeded by a "negative phase" in which, as a consequence of the complete precipitation of fibrinogen, and not because of any formation of antithrombin, the blood is incoagulable. The anticoagulant venoms must be injected in large doses to produce their characteristic effect, which is due, not to precipitation of fibrinogen—though fibrinogen is diminished—nor to any formation of antithrombin, but to direct destruction of thrombokinase.

MIKULICZ'S DISEASE.

WE published in THE LANCET of Sept. 4th a note by Dr. S. G. Askey on this rare condition, and on Sept. 11th a letter from Dr. Dan Mackenzie describing several cases of his own. We now draw attention to a very remarkable and interesting example of the same disease communicated[1] by Professor Nino Samaja which occurred in the Ospedale Maggiore. His case is of exceptional interest not only because all the salivary glands which are clinically observable were affected by the same morbid process, but also because the enormous increase in volume of the pharyngeal glands on the right side produced an occlusion of the Eustachian tube with unilateral deafness. Professor Samaja states that none of the throat and nose specialists to whom he referred the case had ever met with unilateral auditory disturbance due to this cause, associated with symmetrical hypertrophy of the salivary and lacrymal glands.

The patient was a man, 62 years of age, who had been extremely healthy until he began to experience tinnitus and deafness in the right ear. When he came under observation there was marked hypertrophy of the lacrymal, parotid, and submaxillary glands. On raising the tongue the two enlarged sublingual glands were seen, while the apical glands of Blandin-Nuhn could be palpated, and the palatine glands were visible when the mouth was widely opened. By palpation various other glands were felt to be enlarged, notably the epitrochlear, cervical, axillary, and inguinal (in the latter situation they were as large as a pigeon's egg), rather hard, not tender, and adherent neither to the skin nor subcutaneous tissue. Saliva was somewhat scanty, but other organs presented no abnormalities. Examination of the eyes showed bilateral pterygium and papillary hypertrophy of the conjunctivæ; the lacrymal ducts were pervious. Posterior rhinoscopy revealed that the rhino-pharyngeal space on the right side was occupied by a fleshy mass, pale pink in colour and of smooth contour. Wassermann's reaction was negative, and the blood count showed the relation between white and red cells to be 1 to 941, lymphocytes 26·5 per cent., large mononuclears 3·5 per cent., polynuclears 66 per cent., eosinophiles 1 per cent.—an almost normal proportion.

In Professor Samaja's case radiotherapy was followed by brilliant results: six applications were given with an aluminium filter of 3 mm., spark equivalent 25,

[1] Bullettino delle scienze mediche. 1920. Via Altabella 6, Bologna.

milliamperes ½, duration 20 minutes. Forty days after the last application most of the enlarged glands had disappeared and also the deafness and tinnitus. The effect on the blood count was that the relation between the white and red cells increased to 1 to 604, while at the same time a marked eosinophilia was produced. Professor Samaja distinguishes clinically pure forms of Mikulicz's disease (hypertrophy of the lacrymal and salivary glands without concomitant lesions of other systems) and forms associated either with general lesions of the lymphatic system (leukæmia, pseudo-leukæmia, lymphosarcomatosis, &c.) or with general infections, and he states that the prognosis is in direct relation to the general disease with which Mikulicz's syndrome is associated.

DISLOCATION OF THE CARPAL SCAPHOID.

IN the *Boston Medical and Surgical Journal* for August 26th Dr. William Pearce Coues has described a very rare injury. Dislocation of the carpal scaphoid alone, or associated with semilunar dislocation or fracture, is one of the rarest of injuries. Scaphoid dislocation, when it does occur, is usually the result of a fall from a height on the hyperextended hand. If the radius does not give way the force of the impact is transmitted to the os magnum through the dorsal corner of the semilunar, which brings pressure on the neck of the scaphoid, while the anterior part of the capsule fixes the bone at the centre. Ordinarily from this force a fracture through the neck of the scaphoid results.

A carpenter, aged 54 years, was examined for the Massachusetts Industrial Accident Board on April 7th, 1919. On Jan. 20th, while descending a ladder, he slipped and fell some 20 feet on a concrete floor. He was unconscious for some time after the accident, and was treated in hospital for three weeks. On examination a depressed fracture of the frontal bone and of the head of the right radius, with much new bone about the elbow-joint and practically no motion, were found. There was also inability to use the left wrist, with aching, stiffness, and general disability of the hand. Examination showed bony thickening about the wrist and the styloids practically on a level. There were only a few degrees of active motion at the wrist-joint in any direction, and attempts to increase this passively caused pain. The thumb and fingers were stiff, but he was just able to oppose the thumb to the index finger, although he could not flex the fingers into the palm. The grasp of the hand was weak, and rotation of the radius was restricted. On the palmar aspect of the wrist, just below the end of the radius, was a marked bony prominence. This was immovable and seemed to block the wrist motions almost completely. It corresponded in general level to the situation of the scaphoid. Radiography showed the lower end of the radius fractured and complete dislocation of the scaphoid, with some displacement of the semilunar. It seemed that operation would give the only chance of a useful wrist, but on account of the condition of the other arm the patient declined.

In connexion with this and allied injuries the experiments of Honigschmied are of interest. In 19 cadavers he forcibly extended the hand. In 17 fracture of the lower end of the radius resulted and in 2 rupture of the anterior ligament of the wrist with anterior dislocation of the semilunar. In 8 cases a preliminary dissection of the wrist was made before hyperextension. In 5 the palmar capsule was lacerated, and twice the scaphoid was partially dislocated, and once the ligament between the two rows of carpal bones was torn. It would seem that in the case of scaphoid dislocation from hyperextension intercarpal ligamentous rupture with lateral torsion of the wrist would best account for this unusual injury. The bone is probably suddenly squeezed out of its bed as one shoots the stone from a cherry, a mechanism graphically described by Eigenbrodt in explaining dislocation of the semilunar bone.

THE Harveian Oration will be delivered at the Royal College of Physicians of London by Sir Frederick Andrewes at 4 P.M. on Monday, Oct. 18th.

THE Italian Government have conferred the Italian silver medal Ai Benemeriti della Salute Pubblica upon Dr. Leonard Hill, F.R.S.

PUBLIC HEALTH IN SOVIET RUSSIA.

BY L. HADEN GUEST, *M.C.*, M.R.C.S. ENG., L.C.C.,
SECRETARY AND PHYSICIAN TO THE BRITISH LABOUR DELEGATION.

IV.—GENERAL AND SOCIAL DISEASES.

THE difficulty of forming an accurate impression of health conditions in Soviet Russia is much increased beyond that usual in all countries by (1) absence of trustworthy statistics; (2) great variation in conditions from one part of Russia and Siberia to another; (3) disturbances due to revolution and to war.

Malnutrition and its Results.

With regard to general nutrition it has been already pointed out that the towns are half-starving. The industrial workers are many of them anæmic, underfed, some obviously very ill. But in the country districts conditions are better, and, speaking broadly, the peasants have enough to eat, although they may lack certain things, such as salt (Samara Province) or meat (in most provinces). Dr. Semasko described one province to us—that of Nijni-Novgorod—as a "starving province." But in Samara Province there was an abundance of eggs and milk—milk, in fact, was used for washing the hair in place of soap in a village visited by one of our number.

But I did not find it possible to get reliable statistics of births, deaths, and causes of death. It was said in Petrograd that the birth-rate was rising rapidly; on the whole, however, the birth-rate seems to be exceeded by the death-rate. Dr. Semasko stated that the birth-rate was going up, but had not reached the pre-war level. Infantile mortality is certainly high. The aged, too, have suffered severely, and the age at death is falling owing to the severity of the conditions of life.

Diseases of children have not markedly increased, but children are below their proper level of development. Rickets was estimated at 80 per cent. of the child population, but I did not see the severe types of case which were common in Vienna in 1919.

Scurvy has doubled its large pre-war figure, and I saw many cases in hospital at Saratov. I was told at Astrakhan that there were 642 cases in hospital then (June 7th), and that 900 cases had been evacuated to Saratov in May, 1920. There has also been a great increase in cases of night-blindness (attributed to shortage of fat), and a great increase in anæmia showing itself in women in a marked diminution of menstruation. *Tuberculosis* has increased very much in the towns, but not apparently more than in Central Europe generally. The Soviet authorities are attempting to increase the hospital accommodation and also the number of the tuberculosis dispensaries, and claimed to have large numbers of beds available. An actual instance at Astrakhan, however, shows the fallacy of mere paper plans and figures. At this place a new Soviet hospital for 750 infectious cases was "decreed." A hospital was brought into being, but it contained only 70 beds and was not properly equipped. It is claimed that since the Soviet Government assumed power there has been an increase of 40 per cent. of permanent beds available for civilians (excluding infectious cases). One of these newly established hospitals, installed in the palace of the ex-Governor at Saratov, was inspected; it was crowded and badly equipped, and although in a splendid building, produced an effect of dirt, deprivation, and poverty. The work of all these hospitals goes on under great difficulties owing to the absence of dressings, drugs, linen, and even of the necessary food. The milk required for hospital cases cannot be obtained in sufficient quantity, practically nothing in the way of an "invalid dietary" exists, while ordinary food, including black bread, is short.

Health of School Children.

No definite statistics are available with regard to the health of school children, as there is no system of medical inspection as in this country. From my own observations I should judge the conditions of school

THE MEMBERS OF THE BRITISH LABOUR DELEGATION TO RUSSIA.

From left to right (standing): Dr. Haden Guest (secretary of the delegation); Mr. A. A. Purcell (Woodworkers); Mr. Robert Williams (Transport Workers); Mr. C. R. Buxton (interpreter and secretary); Mr. H. Skinner (Printers).
From left to right (sitting): Mr. Ben Turner (Textiles); Mr. Tom Shaw, M.P. (Textiles); Mr. R. C. Wallhead (Chairman, I.L.P.).
In foreground: Mr. Clifford Allen (I.L.P.).

children to be much on a par with those existing in the poorer parts of England, with a very great increase in the number of cases suffering from vermin and an increase in certain other ways, noticeably in tuberculosis and in some places of syphilis. A number of institutions for treatment of children have been started in the towns and scattered in the provinces, including special sanatoriums for tubercular and pre-tubercular children and dental clinics. Dr. Semasko told me that children were being born weak, were developing badly, and had much tuberculosis and rickets. Also that the proportion of stillbirths had increased.

Syphilis and Preventive Measures.

Syphilis was stated to be very extensively distributed in Russia. Prostitution, of the old type at any rate, is rapidly dying out and the old prostitutes are being taught to work, but there is still very much venereal disease. Some figures were given me for Petrograd, Olonetz, and Novgorodski Governments for the years 1911–15, as follows:—Cases per 10,000 of the population: Petrograd, 156·1; Olonetz, 123·3; Novgorodski, 92·4. When I quoted a statement made by a Red Cross representative in Switzerland to the effect that 80 per cent. of the population of certain Southern Russian and Ukrainian villages were infected with syphilis, Dr. Semasko agreed that this was a reasonable estimate. As there is a practical absence of any drugs for treating the disease, the spread of syphilis is presumably going on at a rapid rate. The Soviet Government state that between January, 1919, and May, 1920, they opened 3363 beds for syphilis, with 29 special out-patient clinics and 11 laboratories for carrying out Wassermann reaction. I inspected one of the out-patient clinics in Moscow. It was a newly established, practically unused place, with an adequate supply of instruments and furniture and a small supply of salvarsan and allied preparations. In addition to this treatment work the Bolsheviks carry out a propaganda by poster and by leaflet of a convincingly frank description. In Moscow I went over a sanitary exhibition in which were new models of men and women affected with syphilis, the rashes and sores being very well shown. A doctor was on duty in the exhibition to show people round, but there was only one person besides myself going the rounds when I was there. The models were very good, and horrible enough to scare anyone into a very reflective state of mind.

Alcohol Scanty.

It is well known that during the war the Czar prohibited the distribution of alcohol. The Bolsheviks, on taking over power from the Kerensky Government, have maintained this prohibition. Alcohol is said to be more disastrous in its effects on Russians than on Western Europeans. Very strenuous measures are taken against the use of alcohol. In the railway service, for instance, an employee who obtains alcohol illicitly and gets drunk is shot "without mercy," as the high officer who was my informant told me. At the time of the Bolshevik revolution very large quantities of alcohol were deliberately destroyed by the Bolsheviks, an officer who superintended this at one place telling me how he stood over the men doing the work with a revolver in his hand and tested each man on his leaving work by smelling his breath. A certain amount of alcohol is still in the country and can be obtained for medical purposes or by the especially privileged. I was

able to get six bottles of champagne, one bottle of old brandy, and three bottles of red Caucasian wine for use of sick. Other small quantities of alcohol were get-at-able in other ways, but generally speaking it is a matter of great difficulty to get wine or any kind of alcohol in Russia. And no doubt the absence of alcohol makes it easier for the Government to control the population. Now, however, the peasants are beginning to want a little wine.

As an example of the difficulties in the way of observation caused by the political disturbances may be mentioned the case of the Ukraine. It appears that ordered Government in that country simply does not exist over large areas. The Government recognised in one town may be repudiated in another only a few miles distant. Much of the country is under the control neither of the "Red" forces nor of their "White" antagonists, but of the "Greens," who are frequently mere plundering bands wielding the authority of bandit chieftains over big areas. There have been in the Ukraine since the revolution at least 16 different Governments. The conditions in that country are not better as regards infections (including syphilis) than Russia, but there is some evidence that considerable areas are more prosperous as regards the food of their own populations.

Reduction of Vitality.

What does emerge from this general survey of conditions is the universal distribution of dangerous infections, the lack of medical supplies, and in particular of soap and disinfectants, and the generally reduced vitality of the population, more especially of the town population. Civilised life is falling to pieces in Russia; the towns are more stricken than the country, and while power is in the hands of a small group of people in the towns, the support of this power is, in fact, very largely in the country population, who supply the armies and who feed the whole population. The danger that these conditions may lead to mere anarchy is obvious, and the existence of many millions of men and women infected with the most dangerous diseases known to exist in immediate proximity to Western Europe is a nightmare conception which should stir Europe to help Russia, even if motives of mere humanity do not.

There is no question of imposing another Government on Russia from without. That is a futile delusion of incompetent interventionists like Denikin and Kolchak. The decay of a whole civilisation must be arrested by many measures of help and assistance, which it is beyond the scope of these articles to deal with, but one of the most important is the provision of such medical assistance as shall give the Russian doctors the necessary drugs, soap, and disinfectants they need not only to save their own people, but to preserve Europe from the danger of virulent, widespread, and recurring epidemics of disease.

THE COLONIAL MEDICAL SERVICES:

REPORT OF THE DEPARTMENTAL COMMITTEE.

BRIEF reference was made in THE LANCET of Sept. 18th (p. 626) to the Report of the Departmental Committee appointed to inquire into the Colonial Medical Services.[1] The terms of reference were as follows:—

1. To consider generally the position of the medical service of the various colonies and dependencies for which the personnel is now provided by the Secretary of State, with a view to maintaining and increasing the supply of candidates for appointment as medical officer and to securing contentment within the service.
2. To consider whether the principle of assimilating the medical service in neighbouring colonies, as already adopted in West Africa, may usefully be extended, and, if so, how far and by what means.

The Committee decided to hear evidence from witnesses competent to express the views of the medical staffs of the various groups of colonies to which appointments are made by the Secretary of State, and also from others acquainted with the conditions of the Colonial Medical Services.

A Unified Service.

In the opinion of the Committee the ideal is a unified service, the personnel of which would be recruited from men who had recently become qualified to practise and would be liable for service in any of the various colonies to which appointments are made by the Secretary of State. They realise, however, that the full attainment of this ideal is not possible at present, and in the various recommendations which they have made in this report they have kept this fact constantly in view and have confined themselves to such measures as are practicable, and would yet go far to meet the legitimate desires and grievances of the various services.

The Report sets out briefly the difficulties which appear to stand in the way of recommending the creation under present conditions of a unified service. These may be summarised as follows:—

(*a*) Members of a unified service must be servants of one Government and paid from the Imperial Treasury, while each colony is a separate Government paying its own medical officers with funds usually derived from local taxation.

(*b*) In some colonies the selection of candidates is made by the Secretary of State, whereas in others only the senior officers are so appointed, the junior officers being recruited locally and appointed by the Governor.

(*c*) There is a wide divergence between the salaries paid on first appointment in the various colonies.

(*d*) Racial difficulties obtain in some colonies to a greater extent than in others.

(*e*) The regulations as to private practice and the opportunities for such practice differ very widely.

(*f*) In most services the appointments are pensionable, but in a few they are not. Moreover, pension scales are not uniform.

(*g*) The regulations as to leave and passage differ widely in the various colonies.

(*h*) In many colonies knowledge of one or more local languages is very desirable.

If the recommendations of the Committee should be carried into effect they are of opinion that after a period of, say, five years, the experience gained should be reviewed by another Committee, in order that, if justified, further steps may be taken towards the formation of a still more unified service.

The Unification of the Colonial Medical Services.

Hitherto a candidate has applied for a medical appointment in a special colony or group of colonies. The Committee recommend that in future the application should be made for admission to "The Colonial Medical Service." The Report states briefly the nature of the following advantages likely to attend the creation of a unified Colonial Medical Service:—

(*a*) It would constitute a recognition of the Colonial Medical Service as a distinct branch of the public medical service of the Empire.

(*b*) The status of the Service in the opinion of the medical profession would be enhanced.

(*c*) The young medical man when asked, as he often is, "What are you going in for?" would be provided with a brief reply, carrying a definite meaning—viz., "The Colonial Medical Service."

(*d*) The above considerations would tend to encourage recruiting.

(*e*) Questions at issue affecting the interests of a unit of the Colonial Medical Service would be settled with much less display of feeling if those concerned knew that they had been submitted to a man of standing in their own profession.

(*f*) Possibly the most immediate and obvious advantage would be that throughout the Service it would be regarded as an attempt to provide them "with an adequate channel through which to express any feelings of discontent which may arise at any time."

The Head of the Colonial Medical Service.

The Committee are of opinion that an officer of standing in the medical profession, whose opinion would have weight with the Secretary of State, and whose name would create confidence in the medical profession, should be appointed a member of the Colonial Office staff, with a title commensurate with the importance of his position. The majority of the Committee recommend that he should be given the title of Director-General of the Colonial Medical Service. His duties may be set out as follows:—

(*a*) Generally he should advise the Secretary of State and the permanent staff of the Colonial Office on all questions relating to the personnel of the Colonial Medical Service as distinct from questions of medical and sanitary theory and practice.

(*b*) He should be accessible to all officers of the Colonial Medical Service who might wish to see him when they are at home on leave.

(*c*) He should advise on all changes in the regulations and conditions of employment of medical officers.

(*d*) He should assist in the interviewing of candidates and of possible candidates for appointment in the Colonial Medical Service.

(*e*) He should be a member of the subcommittee on colonial medical appointments if the present method of entering the service is continued. If it is not, he should be a member of whatever committee may be appointed to interview candidates for medical appointments before their admission to any examination that it may be decided to hold.

(*f*) He should keep in touch with the medical schools in the United Kingdom.

[1] Colonial Office: Report of the Departmental Committee to inquire into the Colonial Medical Services. Together with a letter from the Colonial Office to the Chairman of the Committee. London: His Majesty's Stationery Office, 1920.

(*a*) He should be a member of the Advisory Medical and Sanitary Committee for Tropical Africa when questions of promotion are under consideration by that Committee, and also of the Promotions Committee of the Colonial Office in connexion with the fitness of officers for transfer and promotion in other units of the Colonial Medical Service. For this purpose he would have access to the confidential reports on officers of the Colonial Medical Service.

(*b*) He should endeavour to keep in touch with the feeling of the Service and to bring the existence of causes of discontent to the notice of the Colonial Office.

(*i*) He should be concerned in the preparation of and annual revision of a Colonial Medical Service List, to which reference is made below.

(*j*) Should it be decided to adopt the examination system as the method of entry into the Colonial Medical Service, all proposals relating to such examination and its details and conditions generally should be arranged in consultation with him.

Nursing sisters.—No reference is made to the question of the recruitment of nursing sisters. Nursing sisters and nurses are recruited by the Overseas Nursing Association, and there is no reason to doubt that the present arrangement is satisfactory, having regard to the terms offered by the various Colonial Governments. It would probably be desirable that the officer in question should be associated with the Overseas Nursing Association; he might perhaps represent the Colonial Office on the Committee, or be associated with the member of the Colonial Office staff who now sits on the Committee.

Matters outside the scope of the Director-General.—The regulation of the discipline of individual members of the Service whilst serving under Colonial Governments would remain with the Governor and Principal Medical Officer of the colony concerned.

Personnel of the Service.

In the opinion of the Committee it is most desirable that in future the attempt should be made to attract to the Service the best type of young men fresh from the medical schools. Stress should be laid on the importance of recently qualified men being seconded for a resident appointment, such as house physician or house surgeon, preferably at the hospital where they have received their education in the practical subjects of their profession, and failing that, at some other hospital not attached to a medical school, but approved for the purpose by the Secretary of State. The adoption by the army authorities of this system has been successful, and is advantageous alike to the individual and to the Service of which he has become a member.

Method of admission to the Service.—The Committee have considered carefully the proposal that admission to the Service should in future be by competitive or qualifying examination in place of the present method of classification by the Medical Appointments Subcommittee, and have come to the conclusion that the former method presents distinct advantages if, as they have already suggested, the personnel is to be recruited from amongst the men who have recently passed through the schools.

The Committee find that while on several minor points the Colonial Medical Service might be made more attractive the chief and only really important cause of the difficulty in adequately filling vacancies, apart from the scarcity of medical men during the war, is that the improvements in salary and pension prospects in the different colonies have not kept pace with increased rates of emoluments in other classes of medical employment and in private practice or with the increased cost of living.

It might, in the opinion of the Committee, be an advantage if the heads of the medical departments of the public services—viz., the Navy, the Army, India, and the Royal Air Force—could agree to hold a single entrance examination, as is done by the Civil Service Commissioners for the various offices of the Civil Service. Should such an examination be instituted the Committee recommend that the Colonial Medical Service should fall into line with the other departments concerned. Candidates should be interviewed and approved before examination.

The number of medical appointments in the colonies with which the Secretary of State is concerned is about 600. Assuming that the principle of admission to the Service by examination is accepted it would, in the opinion of the Committee, be necessary for the Secretary of State to reserve the right of appointment by selection to certain posts of a special character for which the method of admission by examination is unsuited. This would also apply to admission to certain new departments of the Service, to which reference is made at a later stage of the Report.

Organisation of the Colonial Medical Service.

As a completely unified Service is not at present possible, it would be necessary for candidates to offer themselves for service in those colonies for which they were eligible according to the regulations then in force. The Colonial Office is at present organised in geographical departments, each dealing with the affairs of one or more colonies or groups of colonies. These departments are: (1) Ceylon and Mauritius; (2) Far Eastern; (3) Nigerian; (4) Gold Coast and Mediterranean; (5) East African; (6) Tanganyika and Somaliland; (7) West Indian. The affairs of Fiji, the Western Pacific High Commission, and the South African Protectorates are dealt with by the Dominions Department.

The Committee recommend that the Colonial Medical Service should be organised in the same manner and that candidates should apply for admission to the Service in one or more of those departments.

Assimilation of the Medical Services in Neighbouring Colonies.

The Report discusses in some detail the possibility of forming into separate units the medical services of neighbouring colonies. The medical services of the West African Colonies have already been assimilated and formed into the West African Medical Staff. The Committee have carefully considered the conditions prevailing in the different groups of tropical colonies, and find that the only other medical services that can with advantage be assimilated are those of: (*a*) The Straits Settlements and the Federated and Unfederated Malay States; (*b*) the East African Protectorates and the Tanganyika Territory. The Committee understand that transfers freely take place among officers in group (*a*), and that such transfers involve no loss of leave or pension.

The assimilation of the medical staffs of the four West African Colonies has been a conspicuous success. The Committee strongly recommend that a similar staff be formed for the East African Administrations, and that, as far as possible, the conditions of service, pay, pension, and gratuity be assimilated to those existing in the West African Medical Staff so as to facilitate the ultimate combination of the two services into one medical staff for British Tropical Africa.

Inspectors of Medical Services for West and East Africa.

Emphasis has been laid by several of the witnesses who appeared before the Committee on the desirability of frequent and regular inspection of the individual stations and the Colonial Medical Service generally by some medical man of senior standing, in the interests, not only of the public, but of the medical officers themselves. The Committee regard as a matter of urgency the appointment of officers charged with these duties for West and East Africa, who might be styled "Inspectors of Medical Services," so long as it is understood that "medical" includes the duties now classed as "sanitary." Officers whose duty it is to inspect regularly, in one case the West African Colonies and in the other the East African Protectorates and the Tanganyika Territory, will find plenty of work to occupy them for some six or eight months in the year. For other parts of the empire a system of occasional visits as opportunity serves, or some local emergency demands, by medical men of authority on tropical questions, seems to be all that is required at present.

Pay, Pensions, and General Conditions.

The Committee remark that salaries are at present low and that the cost of living is increasing, and note the necessity for increased pay. They are of opinion that it will be necessary for the Colonial Medical Service to offer an initial salary of at least £600 per annum for whole-time appointments. In many cases in pre-war times the salaries were wholly inadequate. The increased cost of living presses with double hardship upon officers serving in tropical and subtropical colonies who have to maintain out of a fixed income, not only themselves, but also their wives and families in this country.

Pensions and scales of pension.—The Committee understand that the question of the age of voluntary retirement and of rates of pension is under consideration, and, in the circumstances, they refrain from making any specific recommendations, but venture to express the hope that the claims of the medical officers will be considered in a generous spirit.

Gratuity on retirement after nine years' service.—The Committee recommend that the gratuity now given to officers in the W.A.M.S. who desire to retire after nine years' service should be continued and increased to £1500, notwithstanding the fact that few men have availed themselves of it. They also recommend that the gratuity payable after 12 years' service should be increased to £1875, and that similar gratuities should be instituted in the E.A.M.S., or even made general throughout the Colonial Medical Service.

Leave and passage.—The Committee have received but few complaints that the leave granted by the regulations is inadequate in point of duration, but several that the sum allowed for the payment of the passage home does not cover the cost of the journey, particularly when it is necessary to change steamers and remain at intermediate places awaiting the arrival of another boat. Several witnesses have complained that they did not get the local leave of 14 days or more in each year to which they were entitled. From the point of view of health and efficiency, it has been shown that, under certain conditions, relaxation is a necessity for the worker and an economy to the employer. Hence, it would appear to follow that the colony in which the officer has been serving should be responsible for his pay whilst on leave, and that the period of leave earned should be on full pay. The Committee consider that the regulation as regards passages

in force in the Straits Settlements—viz., that an officer returning home on leave is granted a free passage both ways for himself and his wife, and children up to the number of two—is equitable and deserving of general or modified adoption. Officers transferred from one colony to another and returning home before taking up the new appointment should receive free passages for the complete journey, whatever may be the salary of the new appointment.

Provision for widows and orphans.—The Committee understand that a scheme on the lines of that of the West African Colonies and Protectorates for making provision for widows and orphans of officers serving in the East African Protectorates is under consideration. They have received evidence in favour of this proposal, and express the hope that it will be possible to go further in this direction so as to include such European officers as are not now entitled to contribute to any existing fund.

Study leave.—The necessity for study leave, if a medical officer serving in the colonies is to keep abreast of the advance in medical science, has been recognised for some years, but the rapid changes taking place at the present date, particularly in the methods employed for accurate diagnosis, render study leave more than ever necessary. If the period of service to be followed by study leave is to be fixed, the Committee are disposed to put it at five years, and the duration of such study at not less than three months. Every officer should, in their opinion, be required to undergo a second course at the end of a further period of five years, and if an examination is held at the termination of the course to present himself for it. They do not think it is advisable to require that he should in either case pass the examination, but in considering his claims for promotion the fact that he has or has not passed the examination should be taken into consideration. It may be pointed out that the facilities for graduate study in London have since the war been greatly increased. Study leave should be on full pay, and the fees should be paid by the Government.

Specialist appointments.—It is now possible in the army for a man to attain to the highest rank and pay whilst continuing to practise the branch of the profession to which he has devoted his life. The Committee are strongly impressed with the desirability of introducing this principle, wherever possible, into the Colonial Medical Service. The presence on the staff of the larger hospitals in the more important colonies of a very able physician, surgeon, and gynæcologist and of specialists in these departments which are everywhere recognised—not omitting the head of the clinical laboratory—is of advantage not only to the patients under their care but to the whole of the medical men whose practice brings them into contact with that hospital. It is not, indeed, an exaggeration to state that the standard of clinical work throughout a colony may be raised by the existence of such a hospital staff. The Committee recommend that specialist appointments should be created and given to officers of the Service who have shown capacity in some recognised branch of medical science or practice, and who desire to continue their particular work.

Promotion.—It has been suggested that the increase of pay by annual increment is an evil, as tending to remove any incentive to effort; but the Committee are not disposed to adopt that view, and no evidence has been brought before them showing that it has had such an effect in the medical services of the colonies.

Designations.—The majority of the Committee recommend that the Colonial Governments should be urged to adopt a nomenclature which would be general throughout the Colonial Medical Service. The head of the medical department in each colony would be called "The Director of Medical Services" (D.M.S.). The next in rank, who would act for him in his absence, would be the "Deputy Director of Medical Services" (D.D.M.S.). According to the extent of the colony, the areas of administration, and the number of medical stations to be visited there would be one or more officers with the title of "Assistant Director of Medical Services" (A.D.M.S.). Then would come Senior Medical Officers (S.M.O.) and Medical Officers (M.O.).

Transfers.—The Committee are of opinion that, alike in the interest of the officers and of the Service, it is desirable to facilitate these interchanges, as they would tend to increase the attractions of the Service and bring into a colony new men with new ideas and a wider experience. They recommend that transfers should not be allowed to affect adversely the ultimate pensions of the officers transferred.

Housing.—The Committee have received a good deal of evidence showing that the housing conditions are very defective in many colonies, and that this is one of the causes of discontent. They recommend that the attention of the local Governments be called to this point.

Confidential reports.—Discontent has been expressed at the system hitherto in force under which the individual officer is not acquainted with the nature of the reports on himself. The Committee understand, however, that it has recently been decided to introduce important modifications into this system, which they believe should go far to remove the objections felt by officers.

Posting to stations.—It is very desirable that a medical officer, on his arrival for the first tour of duty in any colony, should serve for at least a month at the headquarters of the colony, and be attached for duty to the chief hospital, and at the same time learn the routine of administration.

Reference libraries.—The Committee recommend the provision of at least one medical reference library in each colony, and that a paragraph dealing with such libraries should always be included in the annual medical report of each colony.

Auxiliary medical service.—The evidence given leads the Committee to the conclusion that there is room in the West African Colonies for an auxiliary medical service on the lines of that of India or Ceylon. Before such a service could be created it would be necessary to found a medical school. As such a scheme would take some years to mature—i.e., before the first native obtained the licence of the college to practise—it should, if approved, be taken in hand as early as possible. Assuming that the personal material exists from which such a staff could be recruited, it would go some way towards meeting the legitimate desire of the natives to obtain a larger share in the civil service of their country.

Research.—There is no better investment for the money of any colony than scientific research, both medical and economic, and the Committee recommend the creation of such a department as part of the Colonial Medical Service. Any medical officer who may show a capacity for research work should receive every possible encouragement, and such officers in charge of clinical laboratories as give evidence of such capacity should be promoted to the research service, but appointment by special selection should not be excluded. The Committee recommend that a Medical Research Institute under a director should be established in every important colony or group of colonies, and that wherever possible the institute should be placed near to the largest and best-equipped hospital, so that the two institutions may mutually influence each other's standard of work.

Precedence and honours.—In West Africa the heads of the medical departments have been placed on the executive councils, either *ex officio* or personally, and in view of the increasing importance attached to medical and health questions, especially in the tropics, the Committee would be glad to think that this change was likely to become general. The question of the grant of honours by the Sovereign to the medical departments is a more delicate matter, and one on which the Committee hesitate to offer an opinion. They notice, however, that only three present members of the Colonial Medical Services have been the recipients of the C.M.G. for services rendered under the Colonial Office.

The Colonial Medical Service List.—The Committee were impressed with the fact that in the past the existence of the Colonial Medical Service has been almost unknown to the bulk of the medical profession. They state that in their opinion there should be, in addition to the institution of an entrance examination, a Colonial Medical Service List, giving full information as to the conditions of service under the various Colonial Governments and the names, qualifications, and services of the officers in each unit of the Colonial Medical Service. The names and services of the locally appointed officers should also appear in this list.

In conclusion, the Committee express their belief that by the adoption of their recommendations the causes of discontent which have existed in the Service in the past will be removed, and that the Colonial Medical Service will attain to a very high, possibly even to the highest, status amongst the public medical services of the empire.

Progress Already Claimed.

An appendix contains the names of those who gave oral evidence before the Committee. There is also appended a letter from the Colonial Office to the chairman of the Committee, in which considerable progress is claimed in the direction desired by the Committee. These instances are cited:—

1. The unification of the East African Medical Services has already been accomplished in everything but name, as uniform scales of pay have been introduced in all the administrations concerned, and there are uniform regulations as to pension, leave, &c., while the principle of promotion from one Dependency to another in East Africa is recognised.
2. The salaries of the West African Medical Staff have been completely revised, and an initial salary has been adopted in excess of the minimum of £600 a year recommended by the Committee.
3. Considerable progress is being made in the improvement of facilities for research in the colonies: in the case of the Gold Coast, for example, provision is being made for the creation of a special research department, with a staff consisting of a director and six pathologists.

The Report is signed by the following, who constituted the Committee: Sir Walter Egerton, K.C.M.G. (chairman); Sir Harry Verney, Bart., D.S.O.; Sir Humphry D. Rolleston, K.C.B., M.D., F.R.C.P.; Major-General Sir W. B. Leishman, K.C.M.G., C.B., M.B., F.R.C.P.; Lieut.-Colonel Sir James K. Fowler, K.C.V.O., C.M.G., M.D.; Mr. T. Hood, C.M.G., M.R.C.S., L.R.C.P.; Mr. A. Fiddian; with Mr. J. E. W. Flood as secretary.

HYGIENE ON THE SEA:

ACCOMMODATION FOR SEAMEN IN SHIPS OF TO-DAY.[1]

(BY OUR SPECIAL CORRESPONDENT.)

II. THE "OLYMPIC."

THE *Olympic*, of the White Star Line, had an honourable history in the war. She went at great risk to help H.M.S. *Audacious* when that ship was mined; she carried myriads of United States troops to Europe; she ran down and sank a German submarine; and she is the biggest ship built in England, so it was with very particular interest the other day, at Southampton, one went aboard her, reconditioned as she is and sumptuously equipped to make the week's voyage across the Atlantic as free as possible from the traditional hardships of the sea.

Board and Lodging.

Her numerous decks have such lengths of stairs and passage ways that one can easily lose oneself, and in fact I was on board her for hours and saw most of her accommodation, "fore, aft, and amidships," but never found her gymnasium, Turkish bath, swimming bath, or full-sized racquet court, enormous though the space must be which such equipments absorb. The *Olympic* herself is 46,359 tons gross, 22,350 tons register. She is 882 ft. long, 92½ ft. wide, and her load draught is 34·7 ft. Her 50,000 horse-power engines, working on four screws, drive her at 22 knots. When she goes to sea she has generally 3000 people on board; there are boats for 2600 and rafts for the remainder. She carries some 950 first-, 780 second-, and 1100 third-class passengers, with 800 of a crew to look after them, feed them, and keep them safe. The personnel of the chief steward's division is the most numerous, in all 564, amongst whom are the saloon and bedroom stewards and stewardesses; the chef, the chief baker, and the chief butcher and their associates, 90 of them, the staffs for the Turkish bath (male and female), gymnasium, and racquet court, and the barbers. The engine-room has a staff of 165 men now the ship is burning oil, and there are 89 sailors of various ranks and duties. Dr. J. C. H. Beaumont, the medical officer of the ship, and his associate, Dr. Robley Browne, had been instructed by Mr. Curry, the local manager, to show me round the ship of which they are naturally proud, and they kindly gave me every information. To them this account owes most of its interest. Before we get to business I may say that the sumptuous decoration of the best suite, that in which Miss Mary Pickford had just travelled, with its luxurious furniture and richly carved decorations, reminded me of nothing I had ever seen before in a ship; only in the Kaiser's dining-room at the Kiel Yacht Club, a room built ashore to simulate a cabin in a ship, could I recall a parallel.

Sanitation on board a ship is mainly a question of water, food, and air. Drinking water is here very carefully supervised. As it comes from the shore it is stored in well-cleaned cemented tanks, from which it is pumped to large receivers, whence it passes through Chamberland filters before it is distributed, sterilised, to the many small ice-filters all over the ship. Domestic water-tanks for washing water are cleaned and refilled each half voyage. The daily expenditure of water is about 250 tons.

Food on board these liners is so well cooked and so generously provided that it gives the hygienist no anxiety. The daily quantities used are expressed in large figures: meat, 4000 lb.; bread, 3000 lb.; fresh vegetables, 2500 lb.; poultry and fish, of each 2000 lb.; bacon, 1500 lb.; butter, 500 lb.; eggs, 6000; and potatoes, 3 tons. There are four kitchens, one for each first-class saloon (here the second-class meals, too, are cooked), another for the third-class, and a fourth for the crew. There are also separate bakeries. Milk is carried in special refrigerators, and there are separate cool chambers for meat, fish, butter, cheese, eggs, vegetables, and fruit, also for fruit and flowers brought on board by passengers.

Rival Ventilation Systems.

Ventilation is the crucial hygienic question in a ship. The builders of the *Olympic* did a very wise thing when to the three funnels the engine-room required they added a fourth as a ventilating uptake. A ship with her great hot engines necessarily overheats all the air within her, and that air will, of course, escape if a path is open to it, usually by cowls or hatches. Generally there are not enough of these openings, for in bad weather they would all let rain in and that might be even more unpleasant than bad ventilation. Here is the wisdom of a funnel for ventilation; the up-draught is always so strong that the descending rain is carried back, the draught is strong (the funnel rises 60 ft. above the deck), and the volume of air carried out of the ship is enormous. There are side ports in some cabins, through which some air is supplied. But there are inside cabins without ports, and there are the public rooms, as well as passages and sanitary annexes. These are all ventilated by a double system of supply and exhaust ventilating trunks. Fifty large fans force air into every part of the ship, taking their supply from eight thermo-tanks, which in cool or in cold weather warm the entering air to any temperature desired. Twenty-four suction fans are always taking the heated and used-up air out of the ship and discharging it up the ventilating funnel. In addition, each stateroom has an electric fan for hot weather and an electric radiator for winter, so comfort is well considered. In the old days, when the merits of plenum and vacuum systems were being discussed, I felt that, as the old saying has it, "baith's best," and I was pleased to find such good results from them here. So far as one could judge in harbour, and as regards the decks on which people live, the *Olympic* is an unusually well-ventilated ship. It is said on board that as a result there is never any smell of cooking, and that smoke does not remain in the large smoking rooms, both severe tests. Oil-burning also helps ventilation. There is now no coaling and no coal-dust to dread, so the ship is no longer hermetically sealed up for most of her time in harbour, but can be left open to air herself all the time she is not running.

Lavatories and Conveniences.

The first-class cabins have fixed basins and hot and cold water laid on. So have the second class. Wealth will obtain for you increased comfort. In a larger cabin you may have a hanging cupboard for your clothes, you can add a private bath (hot, cold, and spray) and also a private sitting-room. The first-class division includes a dining-room for valets and ladies' maids which is a comfortable place. In the third-class each cabin has a folding wash-place with a water-tank filled by hand daily. There are 16 bath-rooms in this section, and the cabins are quite good, even if small. The general third-class accommodation includes saloon, social hall, smoking-room, and children's room, with the poop and well-deck for open-air exercise, so that advances in comfort are not made only for millionaires. It was in the *Oceanic* years ago I first saw hot ovens for warming the plates of third-class passengers. One great advantage of these newer ships is their complete freedom from insect pests.

The stewards have their accommodation amidships, arranged in small dormitories for about 20, for each man a comfortable bed and a locker. Their lavatories, water-closets, and bathrooms are well equipped. Forward on the port side there is a large mess-room for stewards, with a bar. Here they may have their meals, though often they are so pressed for time that they prefer to get their meals in the old bad way, standing in the pantry. But at night, when their work is done, they have this mess-room of theirs for a canteen and recreation room—a vast improvement on old-time conditions. I should imagine this improvement to be due in

[1] The former article on Accommodation for Seamen in the *Aquitania* appeared in THE LANCET of Sept. 11th, p. 569. In that article the cubic dimensions of the cabin for two men should have been given as *648* (9 × 9 × 8) and not 728 cubic ft. 300 in the following line should read *220*.

part to awakening conscience, but even more to the increasing size of ships, while the numbers of staff carried are not increasing quite so fast.

Seamen's Quarters.

The seamen, about 80, and engine-room staff (apart from officers) live forward in cabins very like those of the third-class passengers, but not all the beds are of that quality, for I saw several of the old "donkey's breakfast" pattern, beds stuffed with straw. Their cabins generally hold each three men, who can rarely be there together, and each has in it a basin. The seamen petty officers have a mess of their own, but the rank and file have their meals in a spacious mess-deck similar to that of the stewards, but over the other side of the ship, with fixed tables and forms for seats. The only place in the ship I did not like was the lavatory water-closet accommodation for "oil attendants." (I did not see the seamen's accommodation.) It was dingy. It had a yellow dado round it. I think everything else in the ship was painted white: a great thing, it costs money, but it shows up dirt and so increases health, and it raises the self-respect of the men. Whitewash is, of course, anathema, except perhaps overhead. The yellow dado gave one at once a suggestion of forlornness, discomfort, and neglect. The water-closet compartment was bounded by a considerable area of the ship's side. That had been painted with cork paint, but with very thin cork paint, not enough, in my opinion, to keep out the cold of English seas, let alone the winter temperature of New York. Surely those surfaces and the pipes there could be cased in wood, or at any rate have wooden shutters over them to keep the cold off. The water-closets were of the same order of comfort as the yellow dado. I think it was a trough closet, it was choked, the seats were wet and dirty and not scrubbed, there were no latrine-paper boxes, no latrine paper, and only a torn sheet of newspaper lying on the floor. There were lavatory basins with cold water only, and there were two douche-baths with hot and cold water. These last were the only fittings that gave any joy to an acquaintance I made at this point. He seemed to have nothing to do, and was very helpful—a fireman, he said, of the ship, and a Seamen's and Firemen's Union official, I gathered. I asked him to admire the accommodation for the men in this ship, but he would not. I asked him if he had ever seen better. He had, he said, in the German Merchant Service. It might have been; they were a good deal ahead of us before the war in looking after their crews. He complained of the water-closets, &c.—very reasonably, I thought. His tone was indignant and querulous, and I could not blame him. Seamen have found it hard to get their grievances redressed. Why not hot water to the men's wash-places? Their hands want a great deal of washing, even though the fireman of to-day, called now an oil attendant, talks of his work as a "gentleman's job," as it only takes sense, not physical toil, and involves no sweat and no dirt, and there is a hot-water supply close by.

Hospital Equipment and Nursing.

Dr. Beaumont showed me the very complete hospital equipment, a dispensary and operating-room, in which 89 anæsthetic operations were done in the three and a half years before the war. On no occasion was it necessary to stop or slow the ship, so steady is she. There is a hospital for men, a hospital for women, also a hospital for infectious diseases with a special uptake ventilation. There is also a very good padded cell. The whole is lavishly equipped. There are an incubator for dealing with suspected throat swabs, &c., a dental chair, and a gas apparatus. There are electric baths and an ultra-violet-ray bath. I noted that the bedside receptacles for seasick persons are fitted with papier maché containers which, when used, are burnt. There is a dispenser, who has with him a mate, the ship carries two certificated nurses, and there are two medical officers, as I have said. The medical examination of the steerage passengers is an anxiety. It must be very exactly done this side and repeated on the voyage, or there will be trouble with the immigration authorities on the other side; but for the moment the medical profession on board feels satisfied, as oil-burning has relieved the waiting-rooms of the formerly numerous cases of heat-stroke, colic, and wounds and abrasions of hands.

Before closing I must mention one of the many ingenious appliances on the bridge for facilitating navigation, the clear-view screen, allowing sights to be taken in rainy weather. The glass through which one regards the light whose position is wanted cannot be obscured by rain, snow, or fog as it is travelling round 1500 times a minute, and always comes up before your eye, warmed, dry, and transparent.

In conclusion I have to thank the company, and especially the local manager, Mr. Curry, for the particular courtesy with which they arranged that your representative should see everything thoroughly and comfortably, and also Dr. Beaumont, who got together for me so much of the detail which increases the interest of the above account.

MEDICAL EDUCATION IN AMERICA.

THE educational number of the *Journal of the American Medical Association* gives a moving picture of medical education in the United States. The facts, historical and actual, have been obtained by the courtesy of the authorities of the medical colleges in the United States, and are arranged in convenient tables which, when studied carefully, give clear pictures of the changes taking place. Of the 85 medical colleges now existing, 76 are described as non-sectarian, 5 as homœopathic, 1 as eclectic, and 3 as nondescript. A fifth class, the physio-medical, teaching a system of medicine from which all remedies are excluded except those derived from non-poisonous drugs, had 1 adherent college in 1850, 3 from 1902 to 1907, and is now extinct. The number of homœopathic colleges shows a steady descent from 22 in 1901 to 5 at present open. The eclectic schools show a similar decline, having numbered 10 in 1901. Eclecticism as it is known in America is a system of medicine which treats diseases by the application of single remedies to known pathological conditions, without reference to nosology, special attention being given to the development of indigenous plant remedies; an eclectic school is one which professes to select what is best from all other systems of medicine. The three so-called nondescript schools consist, in the words of the report, of two semi-osteopathic and one nominally eclectic affair. Two of them are not recognised even in their own State of Missouri and the third is in Massachusetts, which has a feeble medical practice law.

The total number (76) of non-sectarian medical schools has also steadily decreased from its maximum of 130 in 1906, but it is the more efficient colleges that have survived, and the proportion of students attending non-sectarian colleges has risen to 93·8 per cent. of the total number.

The Grading of Medical Schools.

Whereas in this country the choice of a medical school may safely be left to the individual student, who even if guided only by geographical position or a reputation for football cannot make a serious mistake, in America the standard of teaching and the value of the diploma when attained vary within wide limits. In fact, many of the diplomas given are recognised only in a few of the States. In order to protect the student from being enticed by misleading advertisements, and to raise the standard of medical education throughout the country, the Council of Medical Education and Hospitals of the American Medical Association has made extensive and repeated investigations of the training given at all the medical schools in the country and in Canada, and has rated them in three classes, A, B, and C, according to their degrees of excellence. The student is strongly advised to join a Class A medical school, where (as is shown by tables) the fees are as a rule no higher, and the length of course no longer, than in the poorly-equipped low-grade institutions.

Adequate instruction in the recognition, treatment, and prevention of diseases can be given only in acceptable (Class A) medical

schools, which have expert teachers, well-equipped laboratories, and dispensaries and hospitals where the student can study patients having all varieties of sickness and injuries.

Full details are given of the schedule on which the classification is based and of the standards required. The system of marking consists of establishing four general heads: (1) faculty, (2) product, (3) administration and supervision, (4) buildings and equipment, efficiency under each head being considered as of approximately equal importance, and being allowed 25 points.

Colleges obtaining 70 per cent. or above are rated in Class A, those obtaining from 50 to 70 per cent. in Class B, and those obtaining 50 per cent. or less in Class C. Class A colleges are those which are acceptable; Class B, those which, under their present organisation, give promise of being made acceptable by general improvements; and Class C those (*a*) which require a complete reorganisation to make them acceptable; (*b*) which do not keep satisfactory records of their students in regard to entrance requirements, attendance, grades in courses, division into classes, and reasons for promotion; (*c*) which do not enforce their requirements in regard to admission (including those admitted to advanced standing), promotion, and graduation; (*d*) which give the major portion of their instruction after 4 o'clock in the afternoon; (*e*) which are privately owned and conducted for profit; (*f*) which for other specific reasons are not eligible for inclusion in Class B.

The total number of Class A colleges in the United States is 70, including two homœopathic schools, all the rest being non-sectarian. It is satisfactory to note that 68 out of the 76 non-sectarian colleges (which, as we have seen, account for 93·8 per cent. of the total number of medical students) are acceptable, and that 89·6 per cent. of the total number of students are being educated at acceptable colleges.

The total number of medical students for the year ending June 30th, 1920, was 14,088, an increase of 1036 over last year; the number of students who graduated was 3047, an increase of 391 over 1919.

American Women in Medicine.

An interesting section of the statistics is that devoted to women in medicine.

During the past year there were 818 women studying medicine, or 132 more than last year, and 237 more than in 1918. The percentage of women to all medical students this year is 5·8, the largest percentage since the presenting of these statistics was begun. There were 134 women graduates this year, 27 more than last year, but 19 less than in 1917. Of all the women matriculants, 89 were in attendance at the one medical college for women, while 727 (90·1 per cent.) were matriculated in the 64 co-educational colleges. From the one women's college there were 12 graduates, while 122 (91·0 per cent.) secured their degrees from co-educational colleges.

This increase of women students in co-educational colleges is not surprising, since in recent years some of the largest and oldest medical schools, as Columbia, Tulane, the University of Pennsylvania, Harvard and Western Reserve University, have thrown open their doors to women.

Entrance Standards and Fees Payable.

The acceptable schools require a four years' high-school education or its equivalent, followed by two years' pre-medical college course consisting of chemistry, physics, biology, English composition and literature, and certain optional subjects, before admission. Among the directions laid down by the Council for the curriculum of an acceptable medical school are the following:—

The college should give two years of work consisting largely of laboratory work in well-equipped laboratories of anatomy, histology, embryology, physiology, physiologic chemistry, bacteriology, pathology, pharmacology, therapeutics, and clinical diagnosis. Present-day medical knowledge makes it essential that these subjects be in charge of full-time, well-trained teachers.

Two years of clinical work, largely in hospitals and dispensaries, with courses in medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynæcology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene, and medical jurisprudence. With the higher entrance requirements time is now available in the latter part of the second year for beginning courses in physical diagnosis and the principles of surgery.

It is the policy of the American Medical Association that as soon as conditions warrant, relations should be established with a number of approved hospitals so that a fifth undergraduate year may be spent by the student as an intern under the continued supervision of the medical school.

Post-graduate Experience and Training.

There are now 18 post-graduate schools in the United States, of which 7 are connected with universities in which the graduate teaching is, or will be, as thoroughly and scientifically given as are the courses of the undergraduate medical school. The educational number does not deal largely with post-graduate work, but a list is given of 469 general hospitals throughout the country, which are considered in a position to furnish acceptable internships for medical graduates, followed by a list of 124 special hospitals. From the details supplied as to the number of beds, time and length of appointments, salary, and nature of experience to be obtained, the newly qualified man will get a fair idea of the kind of practical experience open to him.

The Cost of a Medical Examination.

The fees payable at the American medical schools vary within wide limits, and bear no relation to the grading. The majority charge between $125 and $225 a year for four years.

Although 45 colleges listed in Class A charge fees ranging from $150 to $350 per year for each student, the actual expense for teaching that student for the year in these colleges is much more than the fee charged. This larger expenditure is possible because the colleges receive either State aid or private endowment. This shows that no medical college can properly teach medicine on the income received from fees alone.

Taking the average at $175 a year, or, disregarding variations in exchange, roughly £150 for the four years; the fees will be found about equivalent to those in this country, where the composition fee varies in the neighbourhood of £200 for a five years' course.

Recent Changes.

The changes for the better that have taken place during the last 16 years in medical education in the United States have been noteworthy, and are summed up in a leading article which we quote:—

In 1904, when the Council on Medical Education was created, the United States had more medical schools than all other countries of the world combined, the supply far exceeding the needs of the country. While the number of colleges has been reduced from 162 to 85 during the 16 years, the number enforcing an entrance requirement of two years or more of collegiate work increased from four (2·5 per cent. of all colleges) in 1904 to 78 (92·9) in 1920. The number of medical students was decreased from 28,142 to 13,052—the lowest number—in 1919; but, during the same period, the number who had higher preliminary qualifications was increased from 1761 (6·2 per cent. of all students) in 1904 to 13,408 (95·2 per cent.) in 1920. The number of graduates was reduced from 5747 to 2656—the lowest number—in 1919; but the number having higher preliminary qualifications was increased from 369 (6·4 per cent. of all graduates) in 1904 to 2842 (93·3 per cent.) in 1920. While the annual totals of colleges, students, and graduates have been decreased by about 50 per cent., the number of better colleges is 19 times larger than in 1904, and the numbers of better qualified students and graduates are nearly eight times larger.

Many other improvements have been made in the medical schools. Formerly, a number of them had no university connexion, were conducted for profit, or were dependent solely on students' fees. Most of them had inadequate buildings and laboratory space, inadequate clinical material, and their curriculums were only partly graded. Now all but a few are integral parts of high-grade universities; they are enjoying increased incomes, either from State appropriations or private endowments; many have erected new college buildings and installed more and better-equipped laboratories; they have employed larger numbers of full-time teachers. The majority of these schools are now carrying on more or less effective research; all have established closer relationships with hospitals furnishing clinical facilities, and the majority have adopted better methods of teaching in both laboratory and clinical departments. These changes, the report concludes, are producing physicians who, both educationally and professionally, are far better equipped to assume the responsibility for the prevention and cure of disease than those graduating in any former period.

UNIVERSITY OF MANCHESTER.—The Vice-Chancellor, in his annual report, just issued, points out the serious extent to which the University is being crippled, the want of adequate funds affecting staff, accommodation, and research. The none too successful appeal for £500,000 at the close of last year realised less than half the sum required; the appeal is, however, still before the public. Including the School of Technology, 2775 students attended during the session, compared with 1649 in the previous session and 1415 in 1914–15. The women students now number 572, and of these 143 are studying medicine.

TUBERCULOSIS.

The Report of the Ministry of Health.

THIS Report, the appearance of which was briefly noted in THE LANCET last week, includes a colourless, but no doubt accurate, review of recent measures for dealing with tuberculosis. It is a tale of committees, recommendations, grants, and schemes. It does not reflect favourably on the wisdom and prescience of the Departmental Committee on Tuberculosis that it should in 1912 have set the tentative standard of one sanatorium bed and one hospital bed per 5000 of the population, but though the insufficiency of this standard is now admitted, the 1 in 1000 standard, as already established in Denmark, has not apparently been accepted by the Ministry. There are, however, interesting facts to be extracted from this Report, serving, as milestones on a dull road, to mark progress. There are now 15,781 beds for the tuberculous under voluntary bodies and local authorities, and 2258 of these beds were provided during the year under review. Up to March, 1920, proposals had been submitted for the provision of 9830 additional beds. Thus it appears that the crying need for beds is rapidly being made good. The staffing of the tuberculosis machine is also beginning to come up to strength, or nearly so. By the end of March, 1920, county councils had appointed 150 tuberculosis officers, and county borough councils another 108. Tuberculosis dispensaries have also been staffed by 41 tuberculosis officers under the schemes of the metropolitan borough councils. Even the dental welfare of the tuberculous, which has in the past suffered much stepmotherly inattention, is coming to the fore, and by the end of March, 1920, arrangements by 15 county councils and 20 county boroughs for dental treatment of the tuberculous had been sanctioned by the Ministry. In so chronic and subterranean a disease as tuberculosis the latent period between any given measure and the effect it produces on the mortality must necessarily be long and uncertain. But it is encouraging, even if the declining tuberculosis mortality is only in part traced to the activities of the Ministry, to note that whereas the deaths in England and Wales from all forms of tuberculosis in 1918 were 58,073, in 1919 they were only 46,312.

The Tuberculosis Beds of the M.A.B.

If the number of beds provided for the tuberculous is an index to the efficiency of an anti-tuberculosis campaign, then the Metropolitan Asylums Board is to be congratulated on its annual report for 1919–20. As Appendix C shows, the Board's existing and prospective accommodation for the tuberculous is one of 2593 beds. It is not yet possible to judge whether the needs of London have been met by this accommodation, existing and prospective, but the report suggests that the supply will approximately meet the demand. One of the latest steps to be taken by the Board has been the acquisition of an institution at Lowestoft with accommodation for 150 cases of surgical tuberculosis in adults. In the section dealing with finance it is pointed out that the Government originally promised to defray three-fifths of the capital cost of sanatoriums up to £90 per bed. Though this sum was doubled in 1918 the amount is quite inadequate, for it is calculated that three-fifths of the capital cost per bed is likely to exceed £500.

Sanatorium Benefit in Kent.

In the seventh annual report on tuberculosis in Kent Dr. Alfred Greenwood edits the reports received from the seven tuberculosis officers in charge of various districts in the county. The interest of these sectional reports is enhanced by the divergence of opinion, not to say conflict of opinion, expressed by their authors. Some are dogmatic, others agnostic. Stressing the potency of domiciliary infection, one tuberculosis officer calculates that in his area nearly 7 per cent. of his cases of pulmonary disease occurred in "contacts." Hence his plea for the isolation of the advanced and hopeless cases.

Another tuberculosis officer writes:—

"Many of our old beliefs are being shaken, and even the very infectivity of tuberculosis, as we have up to now understood the term, is being questioned ..... the cold truth remains that the medical profession is not yet in possession of the full requisite knowledge either as to the cause, prevention, or cure of tuberculosis."

The remedy is, in his opinion, research work. With regard to the conflicting claims of treatment at home or in a segregation camp, euphemistically termed an industrial colony, Dr. C. C. A. de Villiers, T.O. for district No. 6, advocates the establishment of workshops in each town or area, where men still undergoing treatment can be trained and employed while in receipt of their allowances.

"The training colonies are doing excellent work, but the large majority of men are either unable to comply with the conditions of admittance or are unwilling to leave their homes for any considerable period of time."

American Reports.

Trudeau Sanatorium (Thirty-fifth Annual Medical Report).—The reports published by this sanatorium are always stimulating as well as instructive, and Trudeau's successors show a happy combination of imagination, hustle, and perseverance. To combat the common tendency of sanatorium work to lapse into a rut of dull routine, all examinations and data found to be uninstructive are ruthlessly "scrapped," and new methods and points of view are constantly being studied. The X rays have been found to stimulate interest in the usual physical examination, and the Monday morning diagnostic clinics, where the entire staff meet to discuss individual cases, have proved a valuable whetstone on which to sharpen wits. Another prominent feature of the Trudeau Sanatorium is the close coöperation of clinical and laboratory work. Unfortunately, most sanatoriums provide few or no facilities for adequate research, although the problems of tuberculosis are obviously not going to be solved by the casual investigator. Among the papers published in conjunction with this report is one on the adrenalin test (Goetsch) between pulmonary tuberculosis and hyperthyroidism. It has been employed at the sanatorium for several years and has proved of considerable value.

Loomis Sanatorium, U.S.A. (Twenty-third Annual Report).—What, it may be asked, is the chief function of a sanatorium report? The authors of this report would be justified in calling it propaganda, for they have produced a beautifully illustrated work showing the attractions of the sanatorium surroundings in both summer and winter. Sandwiched in among these pretty pictures is much solid and useful information. Tuberculin, it appears, is given in only a few cases, whereas treatment by artificial pneumothorax is practised in about 19 per cent. of all the cases. The "gratifying success" achieved by this treatment is attributed to careful selection of cases and to the compression of the lung being gradual, except when severe hæmorrhage calls for rapid compression. Interesting studies have been carried out on patients suffering from hay fever, and their pollen sensitiveness was "skin-tested" in some cases with as many as six different pollen extracts. Practically all reacted to ragweed pollen. In addition to routine studies the sanatorium is undertaking: (*a*) an intensive statistical study of the previous year's work on complement fixation; (*b*) a study of the blood in acute cases of tuberculosis to determine the presence or absence of ferments; and (*c*) coöperation with the medical staff in a series of animal experiments on chemo-therapy in tuberculosis. It is evident from various other subjects discussed that Loomis Sanatorium is conducted on progressive and scientific lines.

LITERARY INTELLIGENCE.—Messrs. J. and A. Churchill announce a Text-book on Preventive Medicine, by Professor R. T. Hewlett and Dr. A. T. Nankivell, shortly to be published.—Messrs. Witherby and Co. announce that they will shortly publish a book entitled "A Naturalist in Himalaya," by Captain R. W. G. Hingston, *M.C.*, I.M.S.

CONTROL OF VENEREAL DISEASE:
RECENT CONTINENTAL MEASURES.

NORWAY.

Venereal Disease and Marriage.

RECENT legislation in Sweden dealing with venereal disease in relation to marriage[1] has its counterpart in Norway, and a comparison of the legislative reforms adopted in the two countries shows many parallel features. The Norwegian law, which came into force on Jan. 1st, 1919, does not deal at such length with venereal disease in its relation to marriage as the corresponding Swedish law, but as the following abstracts, for which we are indebted to the N.C.C.V.D., show, very important and far-reaching measures have been adopted to limit the spread of venereal disease, and to protect from infection the innocent party to the marriage contract.

Law of May 31st, 1918, Chapter I., §6.—A person infected with syphilis that is still infectious must not marry. The person who suffers from other venereal disease which is still infectious, or from epilepsy or leprosy, must not marry unless the other party to the contract is informed of the disease, and both parties have been given oral instruction by a doctor as to the dangers involved. The professional secrecy enjoined by the law on doctors does not apply to their disclosure, to the proper authority, of information intended to hinder a marriage being contracted contrary to the enactments of this paragraph. Doctors may be summoned as witnesses in matrimonial law-suits, and paragraph §178 of the criminal law does not apply to doctors in this connexion. The doctor who knows that the subject of any of the above diseases is taking steps to get married under this law is bound to communicate his knowledge to the proper authority.

Chapter II., §13, Nr. 5.—In connexion with the publication of the banns, each of the prospective parties to the marriage contract must give a written declaration to the effect that syphilis is not present in an infectious stage, and whether or not any other venereal disease still in an infectious stage or epilepsy or leprosy exists. If in the declaration the admission is made of the existence of a venereal disease other than syphilis, or of epilepsy or leprosy, proof must be given that the other party to the contract has been informed of this disease, and that both parties have been instructed by a doctor as to the dangers of the disease in question.

Chapter IV., §35, Nrs. 3 and 6.—In connexion with the annulment of marriage, this may be effected if one of the contracting parties has hidden from the other the fact that insanity existed before or at the time of marriage, or venereal disease still existed in an infectious stage, or epilepsy or leprosy, or an incurable physical deformity preventing sexual intercourse. The marriage may not be annulled unless this cause for annulment is pleaded within eight months of the date when the pleader was first informed of this cause.

Chapter V., §49.—A marriage may be annulled when one party can prove that the other party, knowing or suspecting that he or she suffered from venereal disease in an infectious stage, exposed the other party to infection by physical intercourse. If infection has not occurred, and if the disease is no longer infectious, the plea for annulment on these grounds cannot be made later than six months after the risk of infection has ceased. In this matter medical professional secrecy is ruled by the same conditions laid down in Chapter I., §6.

Instructions to Doctors Consulted about Venereal Disease.

In connexion with this law the Norwegian Medical Director has addressed a circular to all medical practitioners in Norway containing suggestions drawn up by the professor of dermatology in the University of Christiania.

Syphilis.—Owing to the capricious course run by syphilis, long periods of latency being interrupted by outbreaks of infectious symptoms, it has always been difficult to decide when a man or a woman who has contracted syphilis may marry with safety. Even the introduction of salvarsan and the combined salvarsan-mercury treatment and the diagnostic and prognostic assistance afforded by Wassermann's reaction have not made these problems easier. There is at present no reliable evidence as to the results of modern treatment, and such evidence is hard to obtain for lack of uniformity of treatment, not only in different countries, but in one and the same country. It can only be claimed that definitely better results are obtained than heretofore; but the disease is still apt to run an aberrant, uncontrolled course when least expected. It is, therefore, clear that the rules to be framed with regard to marriage must still be drawn up with severity and with an eye to the capriciousness of the disease.

A man or woman who has suffered from secondary syphilis must not marry till the expiration of two years after the completion of treatment, and he or she must during this interval have shown no clinical symptoms. The more vigorous the treatment the greater the confidence with which permission to marry can be given, but it is impossible to demand that treatment should be standardised; it should be regulated according to the needs of the individual case. As a rule, the patient should undergo several courses of treatment in the first two years after the outbreak of the disease. It is usual to insist on Wassermann's reaction being negative. It is, however, difficult to depend on this criterion, for there are cases in which this reaction remains positive or soon passes from negative to positive in spite of treatment being vigorous. Yet in such cases there may be no further outbreak of the disease. It should also be noted that in several cases a positive reaction, which has been refractory to prolonged treatment, subsequently becomes negative for good. Tact and discretion are needed, and the decision should preferably be left to the medical man who has treated the patient and followed the course of the disease.

Should the disease break out afresh after the completion of treatment—a rare event if the treatment has been consistently carried out—thorough treatment should be instituted and permission to marry be withheld till the lapse of a one-and-a-half to two-year symptom-free interval and the demonstration of a negative Wassermann reaction. With regard to the woman, a new course of treatment should be recommended before she marries, however long a symptom-free period has passed. The object of this additional precaution in the case of women is the health of the progeny. Cases in which primary syphilis has been thoroughly treated and Wassermann's reaction has never been positive occupy a special position. Usually a complete cure is effected, and marriage may be permitted one to two years after the completion of treatment, provided there have been no clinical symptoms and Wassermann's reaction has remained negative throughout this period. As treatment in such cases takes only a few months, permission to marry may be given two to two and a half years after infection. But it is absolutely essential in these cases that the abortive treatment should have been carried out properly with a series of salvarsan injections, and that the case should have been under close medical supervision.

Code of Rules for Infected Persons.

With reference to Chapter I., §6, according to which the subject of venereal disease (other than syphilis) in an infectious stage and the subjects of epilepsy and leprosy must not marry unless the other party to the contract is cognisant of the disease and both parties have been given verbal instruction by a medical man as to the dangers incurred, the following suggestions and rules have been drawn up by the professors of dermatology and nervous diseases, and by the chief medical officer concerned with leprosy.

Gonorrhœa.—The prospective candidate for marriage, who has suffered from gonorrhœa, should be informed that many cases of acute gonorrhœa are not absolutely cured, but pass on to a chronic stage giving rise to such trifling symptoms that it may be completely overlooked. Yet such an apparently mild catarrh may sooner or later give rise to infection in the other party to the marriage. It is, however, a mistake to assume that every chronic catarrh following acute gonorrhœa is gonococcal. Indeed, most of these chronic catarrhs are not infectious. But it is very difficult to distinguish between gonorrhœal and non-gonorrhœal catarrhs, and the differential diagnosis should be made only by an expert. As chronic, as well as acute, gonorrhœa is far more frequent in men than women, medical men will be consulted chiefly by males, to whom it should be made clear that the transmission of the disease to women entails far-reaching consequences. Among these are sterility, which imposes mental as well as bodily deprivation. If the prospective candidate for marriage is a woman, suffering from chronic inflammation of the reproductive organs, suspected by her to be gonorrhœal, her medical adviser should first make sure of his diagnosis. This is a most difficult matter, requiring much time and careful examination; a single negative microscopic examination is of little significance. Many such examinations must be made at suitable intervals and only when a long series has proved negative can gonorrhœa be definitely excluded. Should gonorrhœa be diagnosed, the woman should be firmly dissuaded from marriage till she has undergone thorough treatment and has received her medical adviser's permission. Should she marry before she is cured she will not only infect her husband but she may also provoke an exacerbation of the disease in herself, rendering it incurable. Should her husband be cured after much suffering and prolonged treatment he may again contract the disease if his wife has not in the meantime been cured. In this manner gonorrhœa, which has evaded eradication at the time of marriage, may prove exceedingly difficult to stamp out.

Ulcus Molle.—Candidates for marriage who suffer from, or who have recently been under treatment for, this disease should be told that they may not marry till further propagation of the disease is impossible and assurance can be given that syphilis has not also been contracted at the same time as the chancroid. To be on the safe side this person should undergo Wassermann's test eight or nine weeks after infection. If this test is negative and there are no clinical symptoms it is permissible to assume the absence of syphilis.

With regard to Chapter II., §13, Nr. 5, it may be noted that when either of the prospective parties to marriage suffers from venereal disease, epilepsy, or leprosy the authorities celebrating the marriage must be assured that both parties have received instructions from a physician as to the dangers entailed. In this connexion a medical certificate is required. The law also refuses to recognise the privilege of professional secrecy in these matters; medical evidence may be called in litigation involving marriage, and a physician who knows that a person contemplating marriage suffers from any of the above diseases is bound to communicate his knowledge to the authorities concerned. In this connexion the medical profession is urgently reminded that contravention of the marriage law by persons suffering from one of the above diseases must not be facilitated by a conspiracy of silence on the part of the

[1] THE LANCET, 1919, vol. ii., p. 1164.

medical profession. In other words, active intervention is expected of the medical profession under certain conditions.

DENMARK.

Registration of the Syphilitic.

One of the movements in Denmark towards stamping out venereal disease which has aroused most discussion and criticism during the last two years is based on the principle of notification followed up by the registration and subsequent permanent supervision of every case of syphilis. More than one scheme has been outlined with this object in view, but its principal aims are kept in view by all concerned. The difficulties of such a universal centralised scheme are numerous and obvious, but Denmark offers exceptionally favourable opportunities for a comprehensive survey and control of all its syphilitic inhabitants, as its population is comparatively small and concealment and evasion are correspondingly difficult. Already one-half to two-thirds of all the cases of syphilis in Copenhagen are said to be under the care of State or municipal medical officers, and this material alone should form an admirable nucleus on which to build an elaborate system of research and treatment. It is proposed that every patient's dossier should be filled in a central office, where information as to his history, symptoms, reactions, and terms of treatment would be collected and analysed. By such a scheme, which would include periodic clinical and serological examinations, much would be learnt as to the development of tertiary phenomena, including disease of the central nervous system. The scheme would also enable pathologists to correlate their post-mortem findings with the patient's clinical and serological records. The cost of such a scheme would be negligible when viewed in the light of the financial burden already borne by the community in its treatment of general paralysis and other syphilitic diseases.

SWITZERLAND.

Compulsory or Voluntary Measures?

In the *Schweizerische medizinische Wochenschrift* for July 15th Dr. Gustav Peter, of the dermatalogical clinic in Zurich, crystallises the principal problem of venereal disease in the question, Is a policy of propaganda and education alone sufficient to promise the suppression of this disease? In other words, Can an appeal to the individual's reason and good sense be so fruitful that compulsory measures can be omitted? His emphatic answer in the negative is largely the expression of the experience he has gained at the dermatological polyclinic in Zurich during two and a half years. The 1000 male patients who attended for venereal disease in this period were classified according as the results of free treatment were good, bad, or indifferent. In 763 cases the disease was gonorrhœa and in 396 it was syphilis. Thus there was a total of 1159 cases, the additional 159 representing the combination of gonorrhœa and syphilis in the same patient. In 143 cases of the 1000 reinfection occurred more than once. As Dr. Peter's tables show, the prognosis, as careful investigation of every case indicated, was good only in 52 per cent.; in 47 per cent. it was bad. Unsatisfactory as these figures are, he does not consider them misleading, and he quotes Philip, who, in 1914, analysed the histories of 1433 insured patients suffering from syphilis in Hamburg. In 89 per cent. they were found to be most inadequately treated, and only in 11 per cent. was even comparatively effective treatment carried out. A significant feature of the Zurich figures was the fact that in as many as 35 per cent. the age of the patient was under 25 years. Another deplorable fact was the frequent incidence (15 per cent.) of reinfection. These are the findings which have driven Dr. Peter to conclude that "the main cause of the failure of our efforts is the psychological factor." How, he asks, can we expect to prevent by educational and voluntary methods healthy persons from contracting venereal disease when we find that those already infected are so callous as not to carry out the treatment nor to practise the advice given them? Not only do they neglect treatment, but in many cases they expose themselves to reinfection, and thus render nugatory whatever results previous treatment may have achieved. In this connexion it is deplorable that neither syphilis nor uncomplicated gonorrhœa gives rise to much pain; as a rule, the treatment is considerably more painful than the disease. And this contributes not a little to the triumph of folly and indolence over the well-intentioned and oft-repeated advice of experts. Hence the necessity for legislation ensuring compulsory treatment, and Dr. Peter prophesies that compulsion will prove to be the only effective solution of the problem of venereal disease.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

Medical Pioneers in Western Canada.

AT the fifty-first annual meeting of the Canadian Medical Association, held in Vancouver during June, the President, Dr. Robert E. McKechnie, of that city, dealt chiefly in his presidential address with medical affairs in Western Canada, which he described as one vast country stretching from Winnipeg to Vancouver. Dr. McKechnie considered the medical outlook of Eastern Canada to be insular, whereas in the western provinces, with their uniform conditions of rapidly developing country and similar problems to face and overcome, they had a better perspective, were free from local prejudice, and could more easily criticise and appreciate themselves. When it is realised, however, that this sentiment was expressed at the annual meeting of the national medical body, many of whose members had journeyed from the Far East to the Far West, the idea of any material sectional cleavage in the medical profession in Canada cannot very well be entertained. Speaking for British Columbia, the President told of the first medical men who are shown by any existing record to have practised in the Pacific province—William Anderson, surgeon on H.M.S. *Resolution*, and John Law, surgeon on the *Discovery*, both of whom accompanied Captain Cook on his first and last voyage in 1778. Anderson died of consumption, and Cook appointed a Mr. Samual, surgeon's first mate, as surgeon to the *Discovery*, Law being removed to the *Resolution*. In 1792 Spanish warships entered the Straits of Juan de Fuca, having with them one Louis Galvez, surgeon, who was reputed very skilful. In the same year Captain Vancouver appeared on the scene as an agent of Britain, and took the country from the Spanish. Accompanying him were three surgeons, the most important member of that group being Menzies, surgeon's mate to Watson on the *Chatham*. He was trained at Edinburgh, and equally skilful as scientist and physician. At the end of the voyage Vancouver complimented him, saying that no life had been lost through sickness for a period of three years. Menzies made great collections of plants, &c., and these are to-day gathered in three places—the British Museum, Kew, and the herbarium of the Botanical Society of Edinburgh. From 1792 there is a blank in the medical history of British Columbia. In 1850 a new generation of medical men began to arrive, the first being John Sebastin Helmcken, surgeon to a ship of the Hudson Bay Company, which came round the Horn. Dr. Helmcken is still living in the city of Victoria at the ripe age of 95 years. He was born in London, England, in 1825, and was educated at Guy's Hospital. At one time he was the leading practitioner from San Francisco to the North Pole, there being no other doctor throughout that vast region. Among other pioneers in medicine were John C. Davie, Simon J. Tunstall, J. W. Powell, O. M. Jones. The profession to-day in all western provinces is counted, not by hundreds, but by thousands of men, many of them in isolated localities, not perhaps making money, but devoting their lives to the service of humanity.

Canadian Society of Anæsthetists.

The Canadian Society of Anæsthetists has recently been organised for the purpose of promoting the science

of anæsthesia, its practice and teaching. As nearly all large Canadian hospitals now have specialists in anæsthesia on their staffs, it is fitting that these should form themselves into an organisation for mutual benefit and study. The officers of the society are: President, Dr. Samuel Johnston, Toronto; Vice-President, Dr. William Webster, Winnipeg; secretary-treasurer, Dr. Wesley Bourne, Montreal. The first annual meeting will probably be held in Montreal in October of this year, at the time of the meeting of the American Clinical Congress of Surgeons.

American College of Surgeons.

The Clinical Congress of the American College of Surgeons will be held in Montreal about Oct. 20th. It is expected that it will be the largest medical convention ever held in Canada. The programme is chiefly clinical in character, and as the clinics will be held at the hospitals admission will be by registration and ticket. Many eminent surgeons are expected from Canada, the United States, France, and Great Britain.

Changes in the Canadian Medical Services.

Major-General Carleton Jones, sometime Director of the Canadian Medical Services, has taken up his residence in Italy. Major-General John Taylor Fotheringham, C.M.G., who succeeded him, has recently retired from the service and re-entered private practice in Toronto as consulting physician. Before laying down his office General Fotheringham issued a farewell statement expressing his deep sense of the constant loyalty and high efficiency of the Canadian service as a whole, both overseas and in Canada, and of his indebtedness, as officer administering the service in Canada, to the personnel as a whole.

Toronto, Sept. 2nd.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Dangers of Fresh Milk for Babies.

SOME time ago attention was called by an article in the periodical, *Kosmos*, to the ill-effects of fresh cow's milk upon babies in a number of districts, and recent investigations have proved the statements there made to be true. It has been ascertained that in certain districts of the country the high infant mortality remains almost unaffected in spite of the strenuous efforts of local health authorities. Close examination reveals the facts that gastro-intestinal troubles are in the majority of cases the underlying cause of death and that these illnesses are traceable to the milk with which the babies are fed. As such troubles are restricted to certain districts, the cows and their food were suspected. It was actually found that certain plants and weeds eaten by cows in the pastures contained substances passing over into the milk and acting as severe irritants to the infantile human gastro-intestinal canal without causing discomfort to the animal itself. The following plants were frequently found to be detrimental: meadow-saffron, corncockle, common convolvulus, and vetch. These weeds proved to be distinctly dangerous, especially if growing on sandy or lime-containing ground. Individual idiosyncracy or predisposition played a marked rôle in the production of untoward effects. During the war, when the number of cows diminished rapidly in this country and goats were kept in increasing numbers, such irritative effects were noted more often, as the latter animals are even less sensitive to irritant herbs. The effectiveness of the campaign against infant mortality is more apparent in the low-lying parts of the country, where the above-mentioned plants are less apt to flourish. Agricultural circles, as well as the medical profession, should exercise vigilance in this matter.

The Housing Problem.

A serious menace to the welfare of the population, especially in Vienna, has arisen in the problem offered by the condition of buildings used for human habitation. Vienna, the capital of a dwarf State of six millions of inhabitants (of whom fully one-third dwell in the city itself) cannot expand as it ought to. Before the war the annual increase of dwellings amounted to 9000, and even at that figure there was a noticeable scarcity of lodgings. For six years nothing has been built, partly owing to the absence of all labourers at the front, partly owing to the fantastic rise in prices of material and labour which set in as soon as the war came to an end. When the soldiers returned marriages took place at the rate of hundreds a day, with the result that at present over 25,000 dwellings, or 2500 houses, are needed to accommodate these newly-married couples alone. The old houses become slowly but surely dilapidated. Sanitary arrangements and renovations are not being attended to because the rent of lodgings is being kept at the pre-war level by legislation, and slums cannot be abolished. The housing problem is becoming a burning question, and the only remedy—money—is not forthcoming. Owing to overcrowding, to the insufficiency of nourishment, and to the prevalence of tuberculosis the poorer classes of the population—the middle classes, the brain-workers, the State and municipal officials—are unable to grapple with the needs of the time, and are rapidly sinking in the social scale. The municipality and the State have made arrangements for the erection of about 400 houses, containing about 2000 dwellings, for their officials and workers, but much time will elapse before these lodgings can be fit for use, and in any case their number is sadly insufficient.

Decrease of Hunger Œdema.

The Union of Sick Clubs reports to the Board of Health that hunger œdema is disappearing steadily and not too slowly amongst the 343,000 labourers of both sexes who are members of the Union. During the worst years of the war the dystrophic conditions were also noted amongst other sections of the population, as well as in other countries—Roumania, Germany, and Serbia. In Vienna during 1917 the reported cases amongst members of the Union of Sick Clubs alone averaged 115 per month, the maximum of 220 being reached in July and August. In 1918 the average was 114 per month, the July figure being 234; the maximum was 259, in August. Then the number fell constantly, and in 1919 the average was 42 cases, the worst months being March with 72 and May with 78. In 1920, January, with 20 cases, was the worst month, and the figure dropped to 6 in July. But cases still occur, and the disease must be absolutely eradicated not only from amongst the labourers, but also from amongst other classes of the population. As an illustration of the actual conditions, it might be mentioned here that the American Famine Area Assistance Committee, which has done such noble work amongst our half-starved children, has decided to open a "war kitchen" for professors and lecturers of the University, because the majority of these men are unable to procure the materials and the fuel necessary for a regular household. Cases of hunger œdema are not absolutely unknown amongst the so-called middle classes.

Drop in Price of Pharmaceutical Articles.

The Government has taken a decided step in keeping down, or rather bringing down, the exorbitant prices of medicines and allied articles by procuring a large quantity of different remedies—aspirin, iodine, codeine, morphine, cocaine—in foreign markets and distributing it by means of the Central Apothecary Board to the various chemists and dispensaries. This stock will be sold to the public at prices far lower than the present ordinary price of these articles, and the poorer classes will thus be able to obtain medical help and relief besides the advice given them gratuitously in the hospitals. Hospitals will also be allowed to dispense such remedies free of charge in certain cases of poverty. No small part of the sufferings of our population were due to the fact that genuine medicines were not obtainable, products of lesser efficiency being substituted for them. Cod-liver oil, for instance, is even now so scarce that a gift from a Norwegian Society consisting of about three barrels of this precious substance was received with the utmost pleasure by our Board of Health for distribution in the children's hospitals.

Sept. 15th.

Correspondence.

"Audi alteram partem."

AMERICA AND POST-GRADUATE MEDICAL STUDY IN LONDON.

To the Editor of THE LANCET.

SIR,—Perhaps your readers will be interested in what was to me a startling item of news. A young qualified physician from one of the Middle Western States of the United States came to my office saying that he was on his way to do some advanced work at Vienna. He said that a committee in Chicago had circularised the physicians in his State, saying that they had organised an excursion for physicians to go to Vienna for study as before the war American physicians were accustomed to do. The committee gave assurances that they had prepared the way for the reception of these physicians in Vienna and for the offering of old-time facilities. Furthermore, the committee were prepared to aid in securing steamer passages and passports. I expressed surprise that one, in the present famished condition of Vienna, and in view of the disruption of the war, should attempt to go there for study. I then presented the facilities for advanced medical study in Great Britain and in London. My acquaintance replied that it was the impression among the physicians in his community that the British medical faculty were not particularly cordial in the reception of American students, and that despite the fact of the great clinical advantages of London the post-graduate work was so submerged and intermingled with the under-graduate work that the opportunities were not comparable with those which were formerly enjoyed in Vienna and Berlin.

Inasmuch as it is one of the functions of my office to promote the exchange of American professors and the interchange of migrating students with the British, and to direct here the stream of American students earlier going to the Continent, it seems as if I ought to apprise the medical schools and hospitals of the above fact.

If properly organised I believe no better authorities or facilities for post-graduate work exist anywhere than here. But unless something is done at once it is evident that our late enemies will soon recover the patronage and prestige that they had before the war. If the British-American fellowship of our nations is so important to the future peace and progress of the world, as is frequently proclaimed, how important it is that not only our universities but also our great professions coöperate in making personal contacts and professional studies in common.

This is a critical and opportune moment. Evidently there is no time to lose. My office, which represents some 60 of the leading Universities and Colleges of the United States, the Institute of International Education in New York, the American Council on Education, the American Association of University Professors, and the Association of American Colleges, is maintained primarily for the service of American professors and students, particularly graduate students. A cordial welcome has thus far been given by the British to the office and our students, but in the field of medicine it seems to me particularly desirable that the interest already shown by the British brethren should be applied immediately to the further organisation and promotion of post-graduate study.—I am, Sir, yours faithfully,

GEORGE E. MACLEAN,
Director, British Division of the American University Union in Europe.

50, Russell-square, London, W.C.1, Sept. 17th, 1920.

*** The general object of the American University Union in Europe, as stated on its notepaper heading, is to serve as a bond between the Universities of the United States and those of European nations, especially by encouraging the attendance and advancing the welfare of American students at the Universities of France, Great Britain, and Italy, in such ways as the trustees may see fit. We comment elsewhere on Mr. MacLean's letter.—ED. L.

THE MASS TREATMENT OF HOOKWORM INFECTION.

To the Editor of THE LANCET.

SIR,—In your issue of July 10th, which I have only just seen, Dr. S. T. Darling takes up the position that diagnosis of ankylostome infestation by the finding of ova in the stools being, as now carried out by the lay microscopist, expensive, time-consuming, and untrustworthy, and disinfestation by anthelmintics being impossible, and indeed unnecessary, all that is needful, once infestation has been detected in a community, is promiscuous treatment, preferably by two half treatments of oil of chenopodium, the staff then passing on to another area, leaving the inhabitants of the first greatly improved in health.

The position, were the premisses sound, would be capable of defence. The premisses are not sound. It is true that as ordinarily carried out microscopic diagnosis is all that Dr. Darling says of it. I have shown, for example, that about half a c.cm. of stool must be examined in the case of Indians of the labouring class before a negative diagnosis of hookworm infestation can be made, since in mild infestations only one egg may be present in somewhat less than that quantity. Further, the strained and centrifuged residue from an aqueous suspension of this quantity of stool must be spread over an area of 24 square inches, if full visibility is to be obtained and accuracy of diagnosis ensured.

Of course, such examination in sparse infestations is expensive, time-consuming, and, since the requisite quantity of stool is probably never examined, untrustworthy. But why not blame the technique and look for something better? I have been able to show in this connexion that by a simple and easily learnt manipulation for washing the sediment of a stool, obtained by fulfilling certain simple conditions as to the straining and centrifuging of a fæcal suspension, there is removed practically all of the fæcal matter, which, however, carries away with it about one-sixth of the ankylostome ova present, and there is left on two square inches of slide five-sixths of the ova from half a cubic centimetre of stool, and practically nothing else. This technique has been labelled "levitation." Is it expensive? That is scarcely the point. The question should be, Is it worth the money? That depends upon a variety of matters, and will be mentioned below. Does it save time? In sparse infestations it saves hours. Is it trustworthy? In the hands of two Indian medical men, trained in levitation and working in jails of the United Provinces of India, it gave an infestation of 84·4 per cent.; while in 326 post-mortem examinations made in that part of India the reports of which have been collated by the Rockefeller Foundation, the percentage of infestation was 82·2. These figures, together with a consistent failure to find ova in a second ½ c.cm. of levitated stool if the first have proved negative, suggest that levitation will give a positive diagnosis in fresh stools in all cases where there are ova in the bowel: that it is in itself time-saving and accurate.

The lay microscopist can be trained to accuracy, and by a modification of what I have described as the "standardising method" he can be checked the whole time, so that it is his administrator's fault and his own good fortune if his falls from grace be not speedily detected. These men are not relatively expensive if employed in numbers in a central laboratory. But this implies that stools must be preserved if they are to reach such a laboratory in a state suitable for levitation. Figures so far as available (they require addition) show that by the use of certain preservatives, and certain preservatives only, levitation gives good results in preserved stools. In such a central laboratory the work will be arranged in shifts, the cheap lay microscopist dividing his time between the attention-straining microscope and the centrifuge and levitation technique which allow of rest to mind and eye, an arrangement which will definitely add to accuracy of work.

The problem of accurate, rapid, and cheap diagnosis seems much nearer satisfactory solution, to put the matter at its worst, than Dr. Darling's paper suggests;

but before we know where we stand there are a number of techniques to be standardised and compared, always remembering that a technique which with certainty concentrates only 10 per cent. of ova may yet for general or particular occasions be better than one which similarly concentrates 80 per cent., provided that the former can start with ten times as much stool as the latter. This being the position regarding diagnosis, it is surely inadvisable, one might perhaps say retrograde and unscientific, to undertake indiscriminate treatment without preliminary diagnosis. Further, when death follows, not necessarily results from, treatment, as must occur from time to time when millions are involved, the procedure simply invites trouble from the suspicious and disaffected, who are sure to say, "Here is a man killed by a dose of medicine given when there was no evidence that he even required it." Such incidents are not in the best interests of mass disinfestation.

Regarding treatment, it is well that the unsatisfactory character of our best anthelmintics, as disclosed by accurate diagnosis, should be emphasised. Dr. Darling feels that it justifies the policy of making no attempt to render a community entirely free from infestation. It is well to realise that in the absence of a satisfactory type of latrine this entails acquiescence in certain and rapid re-infestation with all its grave consequences. It seems no answer to say that this will recur in any case, for it is reasonable to assume that the more complete the disinfestation the fewer foci of infection will remain, and the longer and greater will be the benefit to the community before the whole work has to be undertaken again. That complete disinfestation is unnecessary for the individual cannot, in view of the present trend of medical knowledge and opinion on infections generally, and on this infestation in particular, be accepted without proof. Many will at least agree that the deliberate retention in a given area of unnecessary foci of infection is a grave sanitary sin; while it is unquestionable that to give immigrants a routine treatment and then loose them on a country in the belief that this procedure will keep that country free from ankylostomes can only lead to grave disappointment.

But the crux of the whole problem is, by its title, excluded from Dr. Darling's paper. It is this. So long as there exists no sanitary latrine suitable for the single hut so long is it impossible to eliminate ankylostome infestation from the rural tropics. An insanitary latrine is as dangerous as an insanitary filter, and there has latterly actually appeared in the literature evidence of what one suspected must be occurring—namely, dejectional infestation—infestation, that is, acquired during defæcation, and indeed from the very latrine which was not suspected to be capable of conveying it.

The essentials of the problem seem to be these. The benefits which can, at least temporarily, be conferred upon hundreds of millions of persons should not be withheld because our methods are admittedly imperfect; so long as it is clearly recognised that they can only be temporary and correspondingly costly. At the same time, research must be urgently pushed through on at least three matters: 1. The determination of the best method of mass diagnosis by the standardisation and comparison of the techniques recommended for the removal of fæcal matter from ova, techniques which enable eggs to be detected rapidly and certainly in all cases where they are present in the stools. 2. The search for a drug which will in a single dose, and without risk to the host, remove all hookworms. 3. The designing of a cheap, effective, sanitary, and fool-proof latrine suitable for a single family in the rural tropics.

The morbidity, poverty, infertility, stunting of body and mind, and the mortality resulting from ankylostome infestation in the hundreds of millions of persons affected is in the aggregate so great that the question of cost ought to be of minor importance when any line of investigation is promising in fruitfulness. This is, unfortunately, by no means to say that it will be, although it is one of the most attractive commercial propositions which have ever been offered to any Government.—I am, Sir, yours faithfully,

CLAYTON LANE,
Lieutenant-Colonel, I.M.S. (retd.).

Ealing, W., Sept. 15th, 1920.

THE LATE DR. LEONARD GUTHRIE.

To the Editor of THE LANCET.

SIR,—A photograph of the late Dr. Leonard Guthrie is wanted by many friends at this hospital, but difficulty is being experienced in procuring one suitable for reproduction. I should be glad if readers of THE LANCET could tell me of any photographs in existence, and particularly grateful for the loan of one. Great care would be taken to preserve and return it; reproduction would not injure the print in any way.

I am, Sir, yours faithfully,

H. W. BURLEIGH,
Secretary and General Superintendent, Hospital for Epilepsy and Paralysis, Maida Vale, London, W.

Sept. 17th, 1920.

The Services.

POSTPONEMENT OF COMPETITIVE EXAMINATION IN THE INDIAN MEDICAL SERVICE.

IT is announced that no competitive examination for the Indian Medical Service will be held during 1921. Arrangements for the appointment of candidates by selection in India and in England will, however, be continued. The question of resuming the examination in January, 1922, is under consideration, and an announcement will be made on the subject early next year.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. R. St. G. S. Bond has been appointed Professor of Hygiene at the R.N. Medical School, Greenwich.

ROYAL ARMY MEDICAL CORPS.

Capt. R. C. Matson is placed on the half-pay list on account of ill-health contracted on active service.

Temp. Capt. E. G. M. Gilchrist relinquishes the acting rank of Major.

Temp. Capt. J. E. Measham to be Lieutenant and to be temporary Captain.

Lieut. (Hon. Capt.) F. D. Ross-Keyt, from T.F. Res. (Arty.), to be Lieutenant.

Officers relinquishing their commissions:—Temp. Lieut.-Cols. (and retain the rank of Lieutenant-Colonel) E. Goodall (on ceasing to be employed at the Welsh Metropolitan Hospital), J. B. Byles (on ceasing to be employed at the Brook War Hospital); Temp. Major N. G. Cooper (and retains the rank of Major); Temp. Capt. F. Hannigan; Temp. Capts. (and retain the rank of Captain) W. Garton, R. Hamilton, J. N. M. Sutherland, J. R. Watson; Temp. Lieut. F. T. Allen (and retains the rank of Lieutenant).

TERRITORIAL FORCE.

Capt. (acting Lieut.-Col.) H. S. Beadles relinquishes his acting rank on ceasing to be specially employed.

Capt. E. J. Boome to be Major.

Capt. S. J. Fielding, from T.F. Reserve, to be Captain.

Capt. T. B. McKee resigns his commission and is granted the rank of Major.

Capt. D. A. Wilson resigns his commission, and retains the rank of Captain.

Capt. H. H. L. Ellison (late temporary Captain, R.A.M.C.), to be Captain.

1st London Sanitary Company: Lieut. F. Rae to be Captain.

The King has approved the retirement of Col. C. N. C. Wimberley, who retains the rank of Colonel.

INDIAN MEDICAL SERVICE.

Temp. Capts. Khaliq Dad, Bhola Nath, and Mohammad Afiyat Khan relinquish their commissions and are granted their rank.

DEATHS IN THE SERVICES.

Lieut.-Col. Arthur Holbrook Nott, I.M.S., who died suddenly on August 20th from heart failure while on a visit to the Engadine, at the age of 58, received his first commission in 1887, and reached the rank of Lieutenant-Colonel 20 years later. He had held the post of Civil Surgeon at Murshidabad.

AN International Economic Conference will be held at Caxton Hall, Westminster, London, S.W., from Oct. 11th to 13th. The subjects for discussion will include the present obstacles to economic reconstruction, international finance, problems of coal, transport, and raw material, and coöperative production and distribution as a measure of reconstruction. Visitors and delegates are expected from America, Austria, Belgium, France, Germany, Holland, Italy, and Switzerland. In connexion with the Conference a public meeting will be held in the Central Hall, Westminster, on Oct. 13th, at 8 P.M. Further particulars and tickets can be obtained from the Secretary, Fight the Famine Council for Economic Reconstruction, 150, Southampton-row, London, W.C. 1.

Obituary.

SIR JOHN WILLIAM BYERS, M.D., M.CH. R.U.I., M.A.O. (*hon. causâ*),

PROFESSOR OF MIDWIFERY, GYNÆCOLOGY, AND DISEASES OF CHILDREN, QUEEN'S UNIVERSITY OF BELFAST.

WE regret to announce the death, in his sixty-seventh year, of Sir John Byers, which took place at his home in Belfast on Sept. 20th as a result of cerebral hæmorrhage, closely following on the death of his intimate friend, Mr. Robert Campbell, whose obituary notice he wrote. Prominent in most movements that concern the public weal, he was closely associated with the campaign against tuberculosis and with the reduction of infant mortality, while as a gynæcologist and pediatrist he had more than a local reputation. For many years he was a valued correspondent of THE LANCET, where he placed his wide knowledge of men and things without stint at the service of his profession. A man of warm heart and holding strong views, he ever strove to be just to those who differed from him.

Born at Shanghai in 1853, John William Byers was the son of the Rev. John Byers, a China missionary, and of Margaret Byers, née Morrow, one of a group of famous women educationists, who became LL.D. Dub., and founded the Victoria College at Belfast. His academic record was equally distinguished. He attended the Royal Academical Institution, and later Queen's College in Belfast, and became at the latter senior scholar in natural science as well as in medicine, midwifery, and medical jurisprudence. Both at the B.A. and M.A. examinations he was gold medallist and first in the honours list. At the M.D., M.Ch. R.U.I., in 1878, he again took high honours. Beginning to practise in Belfast, he was appointed physician to the Hospital for Sick Children, holding that position until 1893, when he was appointed professor of midwifery in Queen's College, Belfast, a post which he held for 16 years. In the meantime he became examiner in obstetric medicine at the Royal University of Ireland. In 1909 he was appointed to the chair of midwifery, gynæcology, and diseases of children at Queen's University, which he was still occupying at the time of his death.

His interest in public affairs took Byers to many important gatherings at home and abroad. He presided over the International Congress of Obstetrics and Gynæcology held at Geneva in 1896, over the Section of Obstetrics at the annual meeting of the British Medical Association at Cheltenham in 1901, over the Section of Physical Education and Training in Personal Hygiene at the International Congress of School Hygiene held in London in 1907, and over the Conference on the Hygiene of Childhood at the Royal Sanitary Congress held at Belfast in 1911. Nearer home he naturally occupied the chair at meetings of the Ulster Medical Society and the Belfast Branch of the Irish Medical Association. His practical interest in child welfare was shown in an eloquent introductory address to the students of the London School of Medicine for Women in 1906, when he foreshadowed the important part which women were soon destined to play in the solution of public health questions. Lady Byers did as a matter of fact establish the first babies' club in Belfast some two years later. Sir John Byers was himself one of the first to see and inculcate the importance of antenatal supervision of motherhood in avoiding the causes leading to stillbirth or death in the early months of independent existence. The human element was to him an essential part of maternal welfare, and he was never party to any separation of mother and child or to the substitution of institutional for home life.

As diversions from professional study literature and folk-lore were among Byers's hobbies; his contributions to the Belfast Literary Society were always of interest if not of permanent value. The Belfast Natural History and Philosophical Society also owed him much.

Sir John Byers received the honour of knighthood in 1906. To Lady Byers and three sons who survive him we tender heart-felt sympathy.

PROFESSOR ARMAND GAUTIER.

THERE was in France no more ardent worker for chemical science in its relation to medical advance than Emile Justin Armand Gautier, whose death in his eighty-third year was recently announced. Gautier had been President of the Academy of Science at the Institute of France and occupied the chair of Mineral and Organic Chemistry for 45 years in the Paris Faculty of Medicine. His father, a medical man, gave him the incentive to scientific work, and he chose chemistry as a professional career with conspicuous success. He took a warm interest in chemical forensic questions, and became impressed with the possibilities of error in analytical conclusions based upon the extraction and identification of alkaloids. Reactions which he obtained with extracts from the cadaver appeared identical in certain respects with those given by well-defined bodies of vegetable origin now regarded as alkaloids. But Gautier, while he succeeded in isolating certain bases from putrescent material and in showing that they gave responses to chemical reagents akin to those by which plant alkaloids were identified, adduced no direct evidence to show that these substances were toxic. He called them ptomaines, and food poisoning has been frequently attributed to such bodies. We now have good reason to believe that food poisoning, when it occurs, is of bacterial origin, due not to poisons produced outside the body, but rather to infection from the bacteria themselves when introduced into the human organism. But Gautier undoubtedly deserves credit for the attention given to food poisoning, which led to our present enlightenment. His views were not narrow, any more than the inquiries which he undertook into the widespread distribution of arsenic, the impurities of the air of towns, the "faking" of wines, and the constituents counting for evil in tobacco smoke. He was also a vigorous investigator of many questions in chemistry relating to molecular construction and constitution. By his death France has lost a notable savant.

URBAN VITAL STATISTICS.

(Week ended Sept. 18th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·9, 10·0, and 10·3 in the three preceding weeks, fell to 10·2 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·8, or 0·1 per 1000 below that recorded in the previous week, while among the remaining towns the rates ranged from 3·5 in Exeter, 3·6 in Ealing, and 4·3 in Lincoln, to 15·4 in Bury, 15·5 in Wigan, and 16·6 in Rotherham. The principal epidemic diseases caused 280 deaths, which corresponded to an annual rate of 0·8 per 1000, and comprised 182 from infantile diarrhœa, 54 from diphtheria, 19 from whooping-cough, 13 from scarlet fever, 7 from enteric fever, and 5 from measles. Whooping-cough caused a death-rate of 1·6 in Wolverhampton. The deaths from infantile diarrhœa, which had been 150, 171, and 171 in the three preceding weeks, rose to 182, and included 46 in London, 15 in Liverpool, 13 in Sheffield, 9 in Hull, and 7 in West Ham. There were 2953 cases of scarlet fever and 1591 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2633 and 1484 at the end of the preceding week. The causes of 21 of the 3494 deaths in the 96 towns were uncertified, of which 4 were registered in Birmingham and 2 each in Leicester, Liverpool, and Preston.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 11·1, 9·8, and 11·2 in the three preceding weeks, rose to 11·3 per 1000. The 270 deaths in Glasgow corresponded to an annual rate of 12·7 per 1000, and included 10 from infantile diarrhœa, 5 from small-pox, 2 from diphtheria, and 1 each from enteric fever and scarlet fever. The 63 deaths in Edinburgh were equal to a rate of 9·6 per 1000, and included a fatal case each of scarlet fever, diphtheria, and infantile diarrhœa.

Irish Towns.—The 107 deaths in Dublin corresponded to an annual rate of 13·4, or 0·7 per 1000 below that recorded in the previous week, and included 12 from infantile diarrhœa and 3 from whooping-cough. The 114 deaths in Belfast were equal to a rate of 14·4 per 1000, and included 9 from infantile diarrhœa, 3 from scarlet fever, and 1 each from enteric fever and diphtheria.

Medical News.

ST. MARY'S HOSPITAL MEDICAL SCHOOL APPEAL.—The authorities of this medical school have issued a booklet of 15 pages in which the urgent needs of the school and the arguments in support of the appeal are set out. The importance of medical education to the country and the increased expenditure entailed by modern requirements in teachers, accommodation, laboratories, and equipment are explained in terms comprehensible to the lay public, for whom the book is intended. The need for rebuilding the school is urgent, but with great economy and the use of existing walls it is estimated that the cost will not exceed £30,000. This estimate does not include a block for the pathological institute, where the director, Sir Almroth Wright, and his staff still work in laboratories adapted from wards originally intended for midwifery beds. It is proposed to supply more adequate accommodation for the institute and to release these wards for their original purpose. This part of the scheme is estimated to cost £40,000; the rest consists in the endowment of chairs of (1) Industrial Medicine; (2) Hygiene, Public Health, and Preventive Medicine; and (3) Pharmacology; and of four scholarships of £250 each per annum for promising graduates. The appeal is addressed especially to the heads of great industries and to those interested in medical education in general and in the co-education of men and women, as the continuance of this system at St. Mary's is dependent on the provision of increased accommodation. A preliminary appeal committee consists of Mrs. Lloyd George, Lady Rhondda, Lord Linlithgow, Sir Robert Kindersley, Sir Clifford Allbutt, Sir Malcolm Morris, Mr. Guy Kindersley, Mr. A. R. Prideaux, Sir Almroth Wright, and Mr. T. M. Taylor. Donations, which, if desired, may be earmarked for a particular object, should be sent to Mrs. Lloyd George at 10, Downing-street, London, S.W.1., or to the Dean at the Medical School.

OPENING OF SESSION IN LONDON MEDICAL SCHOOLS. The following announcements have reached us:—

King's College Hospital Medical School.—The session will be opened on Oct. 1st, at 3 P.M., when Mr. F. Richardson Cross will deliver the introductory address.

London (R.F.H.) School of Medicine for Women.—The introductory address will be given at 8, Hunter-street, Brunswick-square, London, W.C., by Miss A. Maude Royden on Revolutionary Thought at 3 P.M. next Friday, Oct. 1st.

Middlesex Hospital Medical School.—The introductory address will be delivered by Professor T. Swale Vincent at the Scala Theatre on Friday next, Oct. 1st, at 3 P.M., after which prizes will be distributed by Earl Beatty.

St. Mary's Hospital Medical School.—The opening of the winter session will take place on Friday next, Oct. 1st, at 3 P.M., when Professor J. G. Adami will distribute the prizes in the library. As already announced, the annual dinner of past and present students will be held at the Connaught Rooms at 7 P.M., Sir John Goodwin presiding. In the course of the evening a testimonial will be presented to Dr. M. M. Bird, the retiring medical superintendent of the hospital.

Westminster Hospital Medical School.—The introductory address will be given at 4 P.M. on Thursday next, Sept. 30th, by Dr. A. M. Gossage in the Board Room of the Hospital.

WEST LONDON POST-GRADUATE COLLEGE.—The autumn session opens on Monday, Oct. 11th, when Sir William Bull will give the inaugural address at 5 P.M. Medical practitioners are cordially invited to attend.

LONDON HOSPITAL MEDICAL COLLEGE.—A special course of lectures open to students and post-graduates has been arranged by the Surgical Unit for Wednesdays and Fridays in October. Two lectures on Some Points in Orthopædic Surgery will be given by Mr. T. H. Openshaw on Oct. 6th and 8th; Dr. J. H. Sequeira will lecture on Tumours of the Skin on Oct. 13th and 15th; Mr. Hugh Lett will lecture on Enlargement of the Prostate on Oct. 20th and 22nd; and Mr. Richard Warren will lecture on Surgery of the Lung on Oct. 27th and 29th. All lectures will be delivered in the Units' Lecture Theatre, London Hospital, E., at 4 P.M.

MEDICAL DEFENCE UNION.—The annual meeting was held at 11, Chandos-street, London, W., on Sept. 16th, Sir John Tweedy, the President, occupying the chair, when a conspectus of the year's activities was presented. During 1919-20 the work of the Union had been steadily maintained, many important actions being successfully defended in the courts, while equally satisfactory had been the number of cases settled out of court to the advantage of the members. Membership had steadily increased in spite of an advance in the subscription to £1. 584 new members were elected as compared with 169 in 1918. The solicitors reported that 138 cases had been referred to them, 86 of this total relating to general and miscellaneous matters; the large proportion of cases falling under this head was explained by the fact that many members had required assistance in putting their affairs in order after returning from war service. The financial report showed an increase in subscriptions of £711 over the corresponding figures for 1918. On Dec. 31st, 1919, the surplus assets over the liabilities, after making the necessary reserve for income-tax, were just over £9000. By a new arrangement coming into force on Jan. 1st, 1921, each member of the Medical Defence Union will be provided with indemnity against damages and costs awarded against him to the extent of £2,500 in any case which is undertaken by the Council of the Union.

THE Hughlings Jackson lecture of the Section of Neurology will be delivered at the Royal Society of Medicine by Dr. Henry Head, F.R.S., on Oct. 7th, at 8.45 P.M. Dr. Head has chosen as his subject, "A New Conception of Aphasia."

A MEETING of the General Council of the National Council for Combating Venereal Diseases will be held on Tuesday, Oct. 12th, at 3.30 P.M., the place of meeting to be announced later.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.—The annual dinner of past and present students will be held in the Adelaide Gallery, Gatti's Restaurant, on Monday, Oct. 4th, at 7 for 7.30 P.M.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN.—A luncheon will be held at the Fishmongers' Hall on Tuesday, Oct. 19th, at which representative men and women will meet to support the school. Sir Alan Anderson, honorary treasurer of the school, will preside, and will be supported by Dr. Mary Scharlieb, Miss Aldrich-Blake, Dr. Jane Walker, Lady Barrett, Dr. Louisa Garrett Anderson, and other medical women.

MANCHESTER TOWN-PLANNING SCHEME.—An inquiry on behalf of the Ministry of Health was held at Manchester on Sept. 15th into a proposed town extension scheme, involving 5269 acres situated chiefly on the southern side of the city. The total cost of the scheme would be over £3,300,000, and at least 50 years would be required for its completion. The principal features are the construction of 56 new streets, several of which would be 100 feet wide, running from three main arterial roads; the limitation to a maximum of 16 in the number of houses to the acre; and the relegation of new smoke-producing factories to a particular area. Provision is made for controlling the density of future building in the area, to preserve as far as possible the open character of districts not yet over-crowded. Building of warehouses and factories, except such as produced no inconvenience, would be confined to the eastern portion. Power is also sought to prohibit offensive advertisements and to prevent gardens or allotments from being kept in a state of nuisance.

CAPITAL VALUE OF MEDICAL PRACTICE: THE DARTFORD SCHEME.—The Dartford scheme to maintain the capital value of a general practice originated at a meeting of the practitioners of Dartford and district, when the question was raised of the approaching loss of the capital value of practices, a loss which becomes more and more serious as larger classes are brought into insurance. The original scheme was purely local, but it was considered possible to develop on the same lines a national scheme whereby doctors might insure payment of the capital value of their practices to their representatives or to themselves when they retired from active work. The scheme was therefore brought before various bodies concerned with medical politics, and has now been officially adopted by the Kent Local Medical and Panel Committees, and is recommended for adoption to their constituents. If these approve the Minister of Health will be asked for his sanction. The scheme is that every year there shall be taken from the county or borough medical pool before its distribution a sufficient sum to pay to each doctor who has retired a sum equal to one year's purchase of his panel practice. This sum will, of course, have been provided by the practitioners to whom the amount would otherwise have been distributed, but each of these will be able to draw a like sum when he retires. In effect, on his retirement each practitioner will be able to sell his practice to his fellows for one year's purchase. The actual terms of the resolution moved by Dr. M. W. Renton at the meeting of the Kent Committees on Sept. 8th, and approved by them, is as follows:—

That in view of the following facts—i.e.: (*a*) That a retiring practitioner had formerly a saleable asset in the goodwill of his practice, and (*b*) that this asset is, or may be, diminished by the coming into operation of National Health Insurance, and (*c*) that the Kent Local Medical and Panel Committees are extremely

anxious to provide against the economic difficulties which are certain to ensue, and particularly in the case of sudden death or incapacitating illness of practitioners, and (*d*) that for administrative reasons no payments could conveniently be arranged except from the medical pool, which is not under the control of these committees:

These committees advise the practitioners of Kent to authorise them to strongly urge upon the Minister of Health that he should, as early as possible, give his permission, make regulations or promote such legislative enactment as may be required to authorise the following payment, i.e.:—

(*a*) A payment of one year's purchase price of his panel practice in the event of a practitioner's death or his retirement from practice owing to old age or infirmity.

(*b*) A lesser payment if he retires for the purpose of starting practice elsewhere—e.g., in Harley-street.

It is pointed out in an explanatory note that the lesser payment is on a sliding scale and is necessitated by the possibility that a practitioner might relinquish his practice just for the purpose of claiming payment and then move elsewhere and repeat the process. It is considered to be further justified in that the primary object of the scheme is to protect widows and wives of those who suddenly fall ill and to provide a little capital for the doctor's old age. Further details are given of the scheme as at present drafted and of the advasntage to be anticipated from its adoption.

HOSPITAL CONDITIONS IN BRISTOL.—At the half-yearly meeting of the Bristol General Hospital Mr. Herbert M. Baker, the chairman, was able to report a substantial increase in subscriptions and donations, which totalled £20,000, as against £16,000 during the corresponding period of last year. It is true that expenditure showed an even greater rise, but the figures warrant a hope that the voluntary sources of income may yet prove equal to the strain that is being put on them.—A number of representatives of the boot and shoe industry and of other factories in the Kingswood district of Bristol have declared their intention of forming a committee to organise collections in factories and workshops for the support of the voluntary hospitals. The Cossham Hospital is a general hospital for East Bristol, founded only a few years ago on a very generous endowment by the will of the late Mr. Handel Cossham; it is now on the verge of debt. It is hoped that whether by voluntary aid or by subsidies from such bodies as the Ministry of Pensions or the Gloucestershire County Council this hospital may still be saved from falling into debt.

BRITISH HOSPITALS ASSOCIATION MEETING AT BIRMINGHAM.—A meeting of this association was held on Sept. 16th at the General Hospital, Birmingham, and was attended by representatives from the West Midland region, comprising Herefordshire, Shropshire, Staffordshire, Warwickshire, and Worcestershire. Sir Arthur Stanley presided, and emphasised the need to strengthen the organisation in view of the legislation anticipated in the future. The Ministry of Health, he said, welcomed the organisation and was anxious to retain the voluntary system. Sir Napier Burnett dealt with the present and future financial needs of voluntary hospitals. He estimated that something like a million pounds was required to put the hospitals of the country back into the position they occupied in 1914. He could see no relief from present anxieties while so many hospitals relied on their present methods of raising money by circulars and spasmodic appeals. Those methods were losing power, and the public was weary of the multiplicity of appeals. It was necessary to supplement the appeal to the ordinary subscribers by a regular stream of weekly collections from the employees of factories, workshops, and business houses, and by guaranteed amounts from employers. The workers were willing to pay a voluntary levy, but the hospitals must create the machinery for its collection. The amount of workmen's contributions per available bed ranged from £1 in some towns to £51 in others. It would have to be explained that the hospitals were of value to a patient's family, to his employer, to insurance companies, to the State, to the municipality, and to a patient's fellow-workers. The almoner system of obtaining contributions from patients might be found effective in many cases. Insurance companies gave meagre financial support in return for what the hospitals were doing for the insured. Municipalities, too, took advantage of the voluntary institutions without making an adequate return. Thus burdens were placed upon the voluntary principle which it was not intended to carry. It was the duty of the State to see that the necessary accommodation was provided for its workers, who might be injured in building up the work of the nation. Some form of State subsidy was required in return for the work which the hospitals did for the State. But it should bear no direct relationship to maintenance. For if it did, as a capitation grant increased, so would voluntary support recede, until in the course of a few years the hospitals would be financed entirely by the State. The subsidy should be limited to providing the requisite additional hospital accommodation, a certain amount of equipment, payment towards the cost of training nurses, and the encouragement of pathological and bacteriological research. Municipally controlled hospitals had proved to be more costly than voluntary institutions. He suggested that in order to overcome present difficulties some of the Poor-law hospitals should be loaned or handed over for use as general hospitals.

RED CROSS CONFERENCE AT BIRMINGHAM.—A conference promoted by the British Red Cross Society and the Order of St. John of Jerusalem was held in Birmingham on Sept. 16th with the object of bringing county organisations into closer touch with headquarters. The Lord Mayor presided and Sir Arthur Stanley gave an address. He said he was certain that much voluntary work must be done in time of peace if the country were to be prepared for war. He did not want his successors to go into the next war as they did into the last, with about £7000 and a set of patterns, almost all of which were wrong, as their whole equipment. When the war ended they were left with a joint war committee and a considerable sum of money. It was realised that the union of the two principal Red Cross agencies should continue and a joint council had been formed. This was followed by the suggestion to form in every county a joint committee, which should coöpt representatives of the other kinds of work they hoped to do in peace time, the object being to coördinate the various branches of voluntary work and to prevent the enormous amount of overlapping and waste of effort that existed at present. Outlining the work of a peace programme, Sir Arthur Stanley said that obviously the first consideration would be services in connexion with the men of His Majesty's Forces who were sick and wounded during the war. Much required to be done, and the joint societies ought to stand to the pensions hospitals in exactly the same position as they stood to the military hospitals during the war. Assistance would also be given to orthopædic clinics and curative establishments. Child-welfare and tuberculosis work must also be undertaken. A motor ambulance service was being established in the counties; 300 or 400 motor ambulances had been brought back from the battle fronts and placed in various districts, and they had a scheme for covering the country with a network of ambulances, so that no patient should be more than 15 miles from an ambulance centre. In reply to questions as to the future status of V.A.D.'s Sir Arthur Stanley said that an answer was being pressed for from the Army Council. It might be taken as certain that the V.A.D.'s would remain part of the Territorial Force, and that their recruiting and training would be left to the two societies.

Appointments.

DUNCAN, D., M.B., Ch.B. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for North Nottingham.

WILLAN, R. J., F.R.C.S., Temporary Honorary Surgeon to the Royal Victoria Infirmary, Newcastle-upon-Tyne.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. M.O. £500.
Aberdeen University.—Lectureship in Bacteriology. £600.
Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £250.
Barnstaple, North Devon Infirmary.—H.S. £200.
Battersea General Hospital (Incorporated), Battersea Park, S.W.—Third Res. M.O. £200.
Bedford County Hospital.—Asst. H.S. £150.
Birmingham, Monyhull Colony for Epileptics and Feeble-minded.—Res. M.O. £700.
Birmingham, Queen's Hospital.—Three H.P.'s, three H.S.'s, Obstet. and Ophthal. H.S., and Cas. H.S. £90 each.
Brighton, Royal Sussex County Hospital.—Asst. H.S. £150.
Cancer Hospital (Free), Fulham-road, London, S.W.—H.S. £150.
Carnegie Dunfermline Trust.—Asst. M.O. £500.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—Tuberc. O. £600.
Colchester, Essex County Hospital.—H.S. £200.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Countess of Dufferin's Fund, India, Women's Medical Service.—Three Medical Women. Rs. 350 per mensem.
Downpatrick, Down District Asylum.—Two Asst. M.O.'s. £300.
Dumfries, Crichton Royal.—Asst. P. £350.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.S. and H.P. £125.
Glamorgan County Asylum, Bridgend.—Jun. Asst. M.O. £350.
Glasgow District Mental Hospital, Gartloch, Gartcosh.—Asst. M.O. £350.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. Anæsth. £25. Also Asst. Res. M.O. £150.
Hospital for Sick Children, Great Ormond-street, W.C.—Cas. M.O. £200. Also Asst. Cas. M.O., H.S., and H.P. £50 each.
Huddersfield Royal Infirmary.—Two Asst. H.S.'s. £150 each.

Hull Royal Infirmary.—Asst. H.S. £150.
Ingham Infirmary and South Shields and Westoe Dispensary.—Jun. H.S. £175.
Johannesburg, South African School of Mines and Technology.—Professorship of Vet. Anat. £860.
Leeds City.—Asst. M.O. £500.
Leeds City Hospitals, Seacroft.—Asst. M.O. £300.
Leyton Urban District Council Education Committee.—Oculist, £125.
Liverpool, Royal Southern Hospital.—H. P. and H.S. £100.
Macclesfield General Infirmary.—Res. H.S. £200.
Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.
Maidstone, Kent County Ophthalmic Hospital.—H.S. £300.
Manchester, Hulme Dispensary, Dale-street, Stretford-road.—H.S. £400.
Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—H.S.
Manchester, St. Mary's Hospitals for Women and Children.—H.S. for Whitworth Park Hospital. £100.
Metropolitan Asylums Board Infectious Hospitals Service.—Jun. Asst. M.O.'s. £515 6*s*.
Monmouthshire Asylum, Abergavenny.—Jun. Asst. M.O. £350.
Montrose Royal Asylum.—Asst. M.O. £350.
Newcastle-upon-Tyne, Hospital for Sick Children.—Two Hon. Asst. S.'s.
Norfolk County Mental Hospital, Norwich.—Sec. Asst. M.O. £350.
Northampton, County Borough Education Committee.—Female Asst. Sch. M.O. £500.
North Riding County Asylum, Clifton, York.—Temp. Asst. M.O. 7 gs. per week.
Oxford, Radcliffe Infirmary and County Hospital.—H.P. £200. Also Administrator. £600.
Plymouth, South Devon and East Cornwall Hospital.—H.S. £200.
Pontypridd Urban District Council.—Female Asst. M.O. £550.
Prince of Wales's General Hospital, Tottenham, N.—H.P. and H.S. £200. Jun. H.S. and Jun. H.P. £120.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.S. £100.
Royal Eye Hospital, St. George's Circus, S.E.—Sen. and Jun. H.S.'s £100 and £75. Also Clin. Asst.'s
St. Mary's Hospital for Women and Children, Plaistow, E.—Hon. S.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £150.
Sheffield Royal Infirmary.—H.S. £150.
Somerset, Wells Asylum.—Asst. M.O. £300.
South Mimms, near Barnet, Clare Hall Sanatorium.—Res. Asst. M.O. £300.
Sydney University, New South Wales, Australia.—Chair of Dentistry. £1100. Also Chair of Physiology. £1150.
University College Hospital Surgical Unit, University-street, W.C.—Third Asst. £300.
Ventnor, Royal National Hospital for Consumption and Diseases of the Chest.—Asst. Res. M.O. £300.
West Hartlepool, Cameron Hospital.—H.S. £300.
Westminster Hospital, S.W.—P. or S. Dis. Skin.
Westmorland County Education Committee and Kendal Borough Education Committee.—Dent. Practitioner. £500.
Wigan Infirmary.—Hon. P. and Asst. Hon. P.
Wilts County Council.—Asst. County M.O.H. and Asst. Sch. Med. Inspec. £600.
Wolverhampton County Borough Education Committee.—Asst. Sch. M.O. £500.
Wolverhampton and Staffordshire General Hospital.—H.S. £200.
Worcestershire County Council.—Sch. Oculist. £550.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Southall.

Births, Marriages, and Deaths.

BIRTHS.

POULTON.—On Sept. 17th, at The Downs, Woldingham, Surrey, the wife of E. P. Poulton, M.D., F.R.C.P., of a daughter.

WHITE-COOPER.—On Sept. 7th, at "North Ford," Dartmouth, Devon, the wife of W. R. White-Cooper, M.B., B.S. Lond., of a son.

MARRIAGES.

GRANT—HODGKINSON.—On Sept. 15th, at St. Giles' Church, Bradford-on-Tone, Somerset, Dr. Gerald Wallace Grant, M.C., to Dorothy Beevor Milnes, only daughter of Mr. and Mrs. Edwin Beevor Hodgkinson, of Risdons, Bradford-on-Tone.

LAWRY—GREGORY.—On Sept. 15th, at the Parish Church, Poynton, Cheshire, James Littleton Lawry, M.D. B.S. Lond., M.R.C.S. Eng., L.R.C.P. Lond., to Dorothy Evelyn, youngest daughter of the late William Gregory, of Sheffield.

MOSER—BYGOTT.—On Sept. 16th, at Wem, Salop, Captain Richard Moser, late R.A.M.C., to Ellen, elder daughter of Mrs. Bygott and the late Edward Bygott, of Wem.

DEATHS.

BYERS.—On Sept. 20th, in Belfast, Sir John William Byers, M.D., M.Ch. R.U.I., aged 66.

MCKINNON.—On Sept. 15th, at King's College Hospital, Dr. A. A. McKinnon, of British Guiana.

PIGEON.—On Sept. 3rd, killed in action in Mesopotamia, John Walter Pigeon, M.B., B.C. Camb., Captain, Indian Medical Service, aged 33 years.

SHOPPEE.—On Sept. 15th, at Warwick-road, Cliftonville, Margate, Edward Collett Shoppee, M.R.C.S. Eng., L.R.C.P. Lond.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Sept. 27th.—2 P.M., Mr. B. Harman: Eye Department. 2 P.M., Mr. MacDonald: Surgical Out-patients.

TUESDAY.—2 P.M., Dr. Burnford: Medical Out-patients. 2 P.M., Mr. T. Gray: Surgical Out-patients.

WEDNESDAY.—2 P.M., Mr. Addison: Operations. 2 P.M., Dr. Owen: Medical Out-patients.

THURSDAY.—2 P.M., Mr. Baldwin: Orthopædic Department. 2 P.M., Mr. B. Harman: Eye Department.

FRIDAY.—2 P.M., Mr. T. Gray: Surgical Out-patients. 2 P.M., Dr. Pernet: Skin Department.

SATURDAY.—10 A.M., Dr. A. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients.

Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

ST. MARK'S HOSPITAL, City-road, E.C.

Course of Lectures on Proctology.

TUESDAY, Sept. 28th.—2.30 P.M., Dr. F. Crookshank: Mucous Colitis.

WEDNESDAY.—2.30 P.M., Mr. H. Graeme Anderson: Fissure.

THURSDAY.—2.30 P.M., Sir Gordon Watson: Operative Treatment of Hæmorrhoids. 4.30 P.M., Dr. S. S. Wyard: Pathological Specimens.

FRIDAY.—4.30 P.M., Mr. L. E. C. Norbury: Sigmoidoscopy.

SATURDAY.—2.30 P.M., Mr. W. B. Gabriel: Demonstration of Cases.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street (behind Whitworth Park).

THURSDAY, Sept 30th.—4.15 P.M., Dr. A. C. Magian: Ovarian Pregnancy.

BOOKS, ETC., RECEIVED.

CHURCHILL, J. AND A., London.

Catalysis and its Industrial Applications. By E. Joblin, M.C. 2nd ed. Pp. 141. 7*s*. 6*d*.

A Course of Lectures on Medicine to Nurses. By H. E. Cuff, M.D. 7th ed. Pp. 257. 7*s*. 6*d*.

Materia Medica, Pharmacy, Pharmacology, and Therapeutics. By W. Hale-White, K.B.E., M.D., Colonel, R.A.M.C. (T.). 17th ed. Pp. 712. 10*s*. 6*d*.

Surgery. A Text-book by Various Authors. Edited by George E. Gask, C.M.G., D.S.O., F.R.C.S. Eng., and Harold W. Wilson, M.S., M.B. Lond. Pp. 1232. £2 2*s*.

Surgical Pathology and Morbid Anatomy. By Sir Anthony A. Bowlby, K.C.B., K.C.M.G., F.R.C.S., and Sir Frederick W. Andrewes, M.D., F.R.S. 7th ed. Pp. 651. 30*s*.

Communications, Letters, &c., to the Editor have been received from—

A.—Air Ministry, Lond.; Earl of Athlone and the Council of the Middlesex Hospital Medical School, Lond.

B.—Messrs. Baillière, Tindall, and Cox, Lond.; Brig.-Gen. W. W. O. Beveridge; Dr. G. Blacker, Lond.; *British and Colonial Pharmacist*, Lond., Editor of; Messrs. Butterworth and Co., Calcutta.

C.—Dr. W. Calwell, Belfast; Dr. W. K. Calwell, Lond.; Mr. R. M. Capon, Liverpool; Mr. C. H. Carroll, Lond.; Charing Cross Hospital Medical School, Lond., Dean of; Dr. H. P. Cholmeley, Little Petherick; Civil Aviation, Lond., Dept. of; Mr. P. P. Cole, Lond.; Mr. A. Cooke, Cambridge; Mr. W. T. Cranfield, Lond.; Messrs. J. and A. Churchill, Lond.

D.—Dr. J. W. Dalgliesh, Sutton; Dr. J. A. Davidson, Lond.; Decimal Association, Lond.; Dr. V. Dickinson, Bournemouth; Direct Fish Supplies, Lond.

E.—Dr. J. R. Earp, Lond.; Dr. T. R. Elliott, Lond.

F.—Messrs. Henry Frowde and Hodder and Stoughton, Lond.

G.—Mr. M. P. Gabe, Merthyr Tydfil; Surg.-Commdr. D. H. C. Given, R.N.; Great Northern Central Hospital, Lond.

H.—Dr. H. W. Hales, Norwich; Prof. A. J. Hall, Sheffield; Messrs. Handley Page, Ltd., Lond.; Miss D. C. Hare, M.D., Lond.; Dr. J. R. Harper, Barnstaple; Mr. F. T. Harvey, St. Columb; Mr. J. F. Heather, Scunthorpe; Prof. A. V. Hill, Manchester; Prof. L. Hill, Lond.; Hospital for Epilepsy and Paralysis, Lond., Sec. of.

K.—Mr. D. M. Kelly, Glasgow; Prof. A. F. S. Kent, Manchester; Kent Local Medical and Panel Committees, Maidstone, Hon. Medical Sec. of; Mr. W. Kirkby, Heaton Moor.

L.—Lt.-Col. C. Lane, I.M.S.; Dr. C. Lillingston, Gorleston; London Hospital Post-Graduate College, Sec. of; London Insurance Committee; London (Royal Free Hospital) School of Medicine for Women.

M.—Dr. A. F. MacCallan, Giza; Dr. P. Manson-Bahr, Lond.; Medical Defence Union, Lond., Sec. of; Ministry of Shipping, Lond.

N.—Eveleigh Nash Co., Lond.

O.—Sir J. O'Conor, Buenos Aires; Mr. W. A. Ogilvy, Birstall.

P.—Panel Committee for the County of London; Mr. V. G. Plarr, Lond.; Mr. R. Puppo, Genoa; Professional and Business Women's League, Lond., Sec. of.

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S.—Scientific and Industrial Research Dept., Lond., Sec. of; Messrs. Siebe, Gorman, and Co., Lond.; Dr. C. Singer, Oxford; Mr. O. T. M. Smith, Berck-Plage; Mr. H. S. Souttar, Lond.; Dr. G. A. Stephens, Swansea; Prof. W. Stirling, Manchester.

T.—Dr. L. Thorne Thorne, Lond.

W.—Dr. A. H. Watson, Salisbury; Prof. H. J. Watt, Glasgow; Dr. R. Prosser White, Wigan; Mr. A. Willbond, Lond.; Dr. W. J. H. Wood, Southampton; Dr. W. H. Wynn, Birmingham; Messrs. Witherby and Co., Lond.

X.—"X Rays."

Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Notes, Short Comments, and Answers to Correspondents.

ON THE NEED OF A NEW TECHNIQUE IN ANTHROPOLOGY.[1]

BY PROFESSOR KARL PEARSON, M.A., LL.D., F.R.S.

WHAT is it that a young man seeks when he enters the university—if we put aside for a moment any social advantages, such as the formation of lifelong friendships associated therewith? He seeks, or ought to seek, training for the mind. He seeks, or ought to seek, an open doorway to a calling which will be of use to himself, and wherein he will take his part, a useful part, in the social organisation of which he finds himself a member. Much as we may all desire it, in the pressure of modern life, it is very difficult for the young man of moderate means to look upon the university training as something apart from his professional training. Men more and more select their academic studies with a view to their professional value.

Prospects of the Student of Anthropology.

We can no longer combine the senior wranglership with the pursuit of a judgeship; we cannot pass out in the classical tripos and aim at settling down in life as a Harley-street consultant; we cannot take a D.Sc. in chemistry as a preliminary to a journalistic career. It is the faculties which provide professional training that are crowded, and men study nowadays physics or chemistry because they wish to be physicists or chemists, or seek by their knowledge of these sciences to reach commercial posts. Even the very Faculty of Arts runs the danger of becoming a professional school for elementary school teachers. I do not approve this state of affairs; I would merely note its existence. But granted it, what does anthropology offer to the young man who for a moment considers it as a possible academic study?

There are no professional posts at present open to him and few academic posts.[2] There is little to attract the young man to anthropology as a career. Is its position as a training of mind any stronger? The student knows if he studies physics or chemistry or engineering that he will obtain a knowledge of the principles of observation, of measurement, and of the interpretation of data, which will serve him in good stead whenever he has to deal with phenomena of any kind. But, alas, in anthropology, while he finds many things of surpassing interest, he discovers no generally accepted methods of attacking new problems: "quot homines, tot sententiæ."

The Type of Student Needed.

The type of man we want in anthropology is precisely the man who now turns to mathematics, to physics, and to astronomy—the man with an exact mind who will not take statements on authority and who believes in testing all things. To such a man anthropometry—in all its branches, craniometry, psychometry, and the wide field in which body and mind are tested together under dynamic conditions—forms a splendid training, *provided* his data and observations are treated as seriously as those of the physicist or astronomer by adequate mathematical analysis.

Such a type of man is at once repelled from our science if he finds in its text-books and journals nothing but what has been fitly termed "kindergarten arithmetic." Why, the other day I saw in a paper by a distinguished anthropologist an attempt to analyse how many individual bones he ought to measure. He adopted the simple process of comparing the results he obtained when he took 10, 20, 30 individuals. He was not really wiser at the end of his analysis than at the beginning, though he thought he was. And this notwithstanding that the whole matter had been thrashed out scientifically by John Bernoulli two centuries ago, and that its solution is a commonplace of physicist and astronomer!

An Exact Technique.

How can we expect the scientific world to take us seriously and to treat anthropology as the equal of other sciences while this state of affairs is possible? What discipline in logical exactness are we offering to academic youth which will compare with that of the older sciences? What claim have we to advise the State until we have introduced a sounder technique and ceased to believe that anthropometry is a science that any man can follow, with or without training? As I have hinted, the problems of anthropology seem to me as subtle as those of physical astronomy, and we are not going to solve them with rusty weapons, nor solve them at all unless we can persuade the "brainy boys" of our universities that they are worthy of keen minds. Hence it seems to me that the most fertile training for academic purposes in anthropology is that which starts from anthropometry in its broadest sense, which begins to differentiate caste and class and race, bodily and mental health and disease, by measurement and by the analysis of measurement.

Once this sound grounding has been reached the trained mind may advance to ethnology and sociology, to prehistory and the evolution of man. And I shall be surprised if equal accuracy of statement and equal logic of deduction be not then demanded in these fields, and I am more than half convinced, nay, I am certain, that the technique the student will apply in anthropometry can be equally well applied in the wider fields into which he will advance in his later studies. Give anthropology a technique as accurate as that of physics, and it will forge ahead as physics have done, and then anthropologists will take their due place in the world of science and in the service of the State.

Francis Galton's Warning.

Francis Galton has a claim upon the attention of anthropologists which I have not. He has been President of your Institute, and he spoke just 35 years ago from the chair I now occupy, pressing on you for the first time the claims of new anthropological methods. In Galton's words: "Until the phenomena of any branch of knowledge have been submitted to measurement and number it cannot assume the status and dignity of a science." Have we not rather forgotten those warning words, and do they not to some extent explain why our universities and learned societies, why the State and statesmen, have turned the cold shoulder on anthropology?

This condition of affairs must not continue; it is good neither for anthropology, nor for the universities, nor for the State if this fundamental science, the science of man, remains in neglect. It will not continue if anthropologists pull together and insist that their problems shall not fail in utility, that their scientific technique shall be up to date, and that anthropological training shall be a reality in our universities—that these shall be fully equipped with museums, with material, with teachers and students.

Planning for the Future.

It is almost as difficult to reform a science as it is to reform a religion; in both cases the would-be reformer will offend the sacrosanct upholders of tradition, who find it hard to discard the faith in which they have been reared. But it seems to me that the difficulties of our time plead loudly for a broadening of the purpose and a sharpening of the weapons of anthropology. If we elect to stand where we have done a new science will respond to the needs of State and society; it will spring from medicine and psychology, it will be the poorer in that it knows little of man's development, little of his history or prehistory. But it will devote itself to the urgent problems of the day.

The future lies with the nation that most truly plans for the future, that studies most accurately the factors which will improve the racial qualities of future generations either physically or mentally. Is anthropology to lie outside this essential function of the science of man? If I understand the recent manifesto of the German anthropologists, they are determined it shall not be so. The war is at an end, but the critical time will be with us again, I sadly fear, in 20 to 30 years. How will the States of Europe stand then? It depends to no little extent on how each of them may have cultivated the science of man and applied its teaching to the improvement of national physique and mentality.

Let us take care that our nation is not the last in this legitimate rivalry. The organisation of existing human society with a view to its future welfare is the crowning task of the science of man; it needs the keenest-minded investigators, the most stringent technique, and the utmost sympathy from all classes of society itself. Have we, as anthropologists, the courage to face this greatest of all tasks in the light of our knowledge of the past and with our understanding of the folk of to-day? Or shall we assert that anthropology is after all only a small part of the science of man, and retreat to our study of bones and potsherds on the ground that science is to be studied for its own sake and not for the sake of mankind?

I do not know what answer you will give to that question, yet I am convinced what the judgment of the future on your answer is certain to be.

[1] Being the concluding section of the presidential address to the Anthropological Section of the British Association.

[2] In London, for example, there is a reader in physical anthropology who is a teacher in anatomy, and a professorship in ethnology, which for some mysterious reason is included in the faculty of economics, and is, I believe, not a full-time appointment.

Mr. W. McAdam Eccles, of St. Bartholomew's Hospital, who has lately removed an "included fœtus" from a male infant, aged 8 months, would be glad to hear of any similar case in which the specimen has been preserved.

PUBLIC HEALTH IN NEW ZEALAND, 1918-19.

IN the report on Public Health and Hospitals and Charitable Aid in New Zealand for the year ending March 31st, 1919, Dr. T. H. A. Valintine, Inspector-General of Hospitals and Chief Health Officer, details his proposals for reorganising and strengthening the department (which include an increase in the number of districts to eight, with 12 medical officers of health), and reviews the general sanitary conditions of the Dominion. A statement of the expenditure borne by the Government in connexion with the influenza epidemic shows that the total amounted to £182,659. In addition to this a sum of £75,374 has been allotted as an annual relief to widows and orphans, and in some cases widowers with children. There was an increase in diphtheria and cerebro-spinal meningitis during the year under review, but scarlet fever, enteric fever, and tuberculosis showed decreased prevalence.

The pandemic of influenza prevailed in New Zealand with considerable severity in November and December, 1918. In these two months 5471 deaths were directly attributable to this disease, the provinces of Auckland and Wellington suffering most, with 3127 deaths between them. Dr. R. H. Makgill, district health officer for Auckland, who makes a special report on the subject, states that there were two distinct waves of infection, the first reaching its maximum about August or September, with an abnormal but not alarming mortality, the second developing in the first two weeks of November, with a virulence far in excess of anything that had hitherto been experienced. This "division into first and second waves, with undue morbidity [fatality] of the second wave, was experienced all over the world, and the greatest intensity of the second wave was almost synchronous in countries so widely separated as Britain and New Zealand." Alluding to the fact that, "whereas in ordinary epidemics the power fails as the wave recedes, this one showed a recrudescent power," Dr. Makgill remarks that there is nothing stable about the virulence of an infective organism, and this applies to the influenzal group as to others. The conditions were very favourable to the spread of disease.

> "Huge bodies of men gathered together in training camps throughout the world, and then hurried overseas in conditions of unavoidable overcrowding, and the concentration in Europe of these overseas bodies of men has never occurred before on such a scale. The massing together of recruits drawn from country districts has produced an ideal field for the cultivation of infective organisms, since these men have not had time to acquire immunity to these organisms."

Popular opinion attributed the outbreak to the arrival of the mail steamer *Niagara* with many cases on board, but Dr. Makgill shows good reasons against this view.

The low degree of resistance to pneumonia among New Zealand troops has been demonstrated in Britain. Dr. Makgill considers this to be—

> "probably the result of the general healthful condition of life and climate [in New Zealand], whereby our population fails to acquire that natural immunity to disease of the type which the slum-dweller derives from constant struggle with invading organisms. It is doubtless to this that we owe the very violent character of the outbreak."

This is an argument that seems to cut both ways. Is the slum-dweller likely to have a greater resisting power to infection *generally* than the countryman? Of the total 5471 deaths from influenza, 2719 occurred in persons between the ages of 25 and 40; that is, 49·71 per cent. of the deaths in 23·88 per cent. of the population. The actually highest ratio was in the age period 30 to 35 (1010 deaths, or 11·19 per 1000 in 8·18 per cent of the population). Males suffered much more than females (6·49 compared with 3·48 deaths per 1000); this agrees with the general experience. In the age groups from 25 to 40 the deaths numbered 1826, or 52·36 per cent. of male deaths in 22·03 per cent. of the male population. Among females between 25 and 40 there were 893 deaths, or 45·43 per cent. of female deaths in 25·64 per cent. of the female population.

The progress of the epidemic is clearly described, and the increase in virulence emphasised.

> "To the student of bacteriology there is nothing inconceivable in the possibility of an organism, by rapid transference from case to case under favourable surroundings, being changed from a harmless saprophyte to a very virulent infective parasite."

Though not always recognised, this is eminently reasonable in regard to many of the specific infections, the causative organisms under certain conditions developing a progressively increasing infective power. Dr. Makgill traces the relationship between the first and second epidemic waves, and describes the preventive measures adopted. Systematic treatment by the use of weak solutions of zinc sulphate in an inhalation chamber was found during two and a half years' experience in the military camps to be highly satisfactory; the proportion of "severe" cases was reduced from 50 per cent. to 22 per cent. among men who were treated daily for three successive days. "Frequent washing out of the nose and mouth with simple salt solution is probably as valuable a family remedy as any which can be suggested."

"THE DOCTOR'S REFERENCE LIST."

A CONVENIENT little book for keeping on the consulting-room table is provided by "The Doctor's Reference List," now in its eleventh edition. Addresses of homes and hospitals for special cases, convalescent homes, inebriate retreats, sanatoriums, private asylums, nursing homes, and benevolent institutions are classified and indexed for ready reference; summaries are included of the Inebriate, Lunacy, and Insurance Acts, as well as other enactments which affect the medical man in regard to the advice which he may give his patient. The value of the book would be increased by careful revision. Names of secretaries are still given who have vacated office by death or other causes. The scope might usefully be widened to include schools for mental defectives, welfare and venereal centres, and similar institutions. The publishers are Messrs. George Pulman and Sons, Thayer-street, London, W., and the price is 1s.

MINERS' SAFETY LAMPS.

MISUNDERSTANDING may possibly arise from our reference to the illumination from safety lamps in an annotation on Nystagmus (THE LANCET, Sept. 11th, p. 562). The light from these lamps certainly becomes less as work proceeds, but this is due rather to an indirect than a direct effect of coal-dust. Dust clogs the gauze which is above the glass cylinder in front of the flame; this clogging interferes with the ventilation of the lamp and so affects the flame. The glass cylinder becomes less transparent owing to deposition of smoke from a flame which is not burning brightly.

SALVIA OFFICINALIS.

SAGE has been credited with many medicinal virtues, and as a popular simple is still used by country folk, though it is not now officially recognised in the British Pharmacopœia. Among its reputed uses were those of a gargle for sore-throats and a cleanser of the teeth, and Mrs. Grieve, of "The Whins" Medicinal and Commercial Herb School and Farm, Gerrards Cross, who has compiled a very interesting pamphlet on the healing virtues of the sage, suggests that the plant might be tried in pyorrhœa. The salvia was so esteemed in time past as to give rise to the monkish line:

> Cur moriatur homo cui salvia crescit in horto?—

a variant of the old English saying:

> He that would live for aye
> Must eat sage in May.

Mrs. Grieve deals with the cultivation of the plant, its preparation for market, chemical constituents, use in medicine, and the preparation of food, and includes some account of other members of the great labiate order. The price of the book is 7½*d.* post-free from the author.

THE EFFECT OF CASTRATION ON UTERINE CONTRACTIONS.

THE effects of castration on the automatic movements of the uterus in the guinea-pig have recently been studied by Mons. Athias, of Lisbon, and in the *Journal de Physiologie et Pathologie* he describes the results obtained by observing the movements of the excised uterus in well-oxygenated Tyrode's fluid—akin to Ringer's fluid—kept at 35° C. The uterus in new-born females shows almost no automatic movements; when excised the uterus contracts and slowly relaxes. The motor functions become distinct a month after birth, the movements beginning 10-20 minutes after the preparation is placed in the nutrient fluid and lasting for 24-48 hours. The movements of the surviving uterus show three periods. There is an initial contracture, during which the relaxed muscle shows contractions which steadily decrease; in 2-6 hours this passes into a period of relaxation, when, as the tonus diminishes, the contractions become more marked and more regular, lasting 24-48 hours; there follows a period of increased tonus which precedes final termination of the contractions. There is no fundamental difference between virgin and previously pregnant uteri. The uterus of the later stages of pregnancy and of parturient animals show specially powerful contractions. In 23 animals of different ages—virgin and previously pregnant—double ovariotomy was performed. During the first 4-6 months after the operation no difference was noted. Only after 9 months, when the activity of the excised uterus showed changes, was atrophy observed. The initial contraction then lasted longer, and the period of relaxation was considerably diminished; the contractions were small and scarcely perceptible, and the terminal period was shortened. The atrophy of the uterus and the accompanying diminished activity occurred considerably later when the animals were castrated during or immediately after pregnancy. In five animals—5-34 days after castration—the ovaries of other females were grafted subcutaneously. In these cases the function of the uterus remained as long as functional ovarian tissue was unabsorbed, which, according to the author, might be for a period of 2-3 years, but the ovarian tissue may disappear within 20 months. It would seem, therefore, that the presence of the ovary is essential for the maintenance of the normal function of the uterus.

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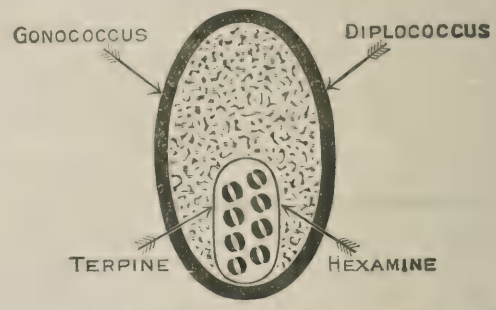

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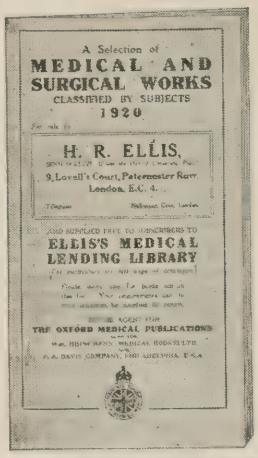

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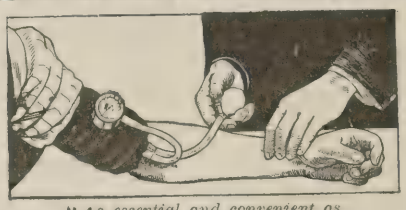

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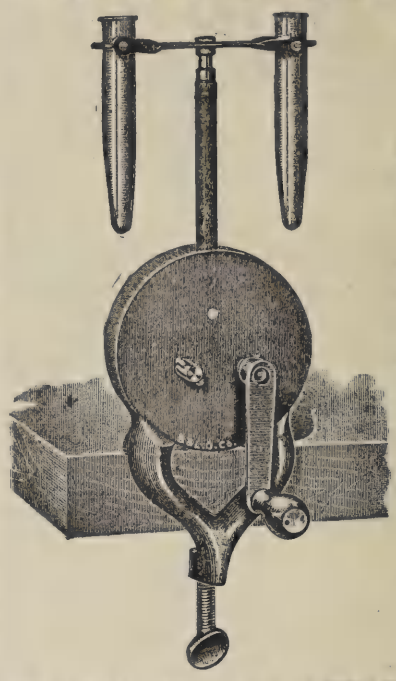

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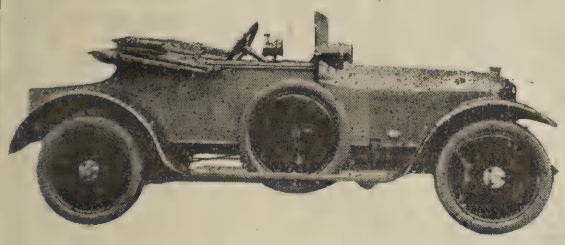

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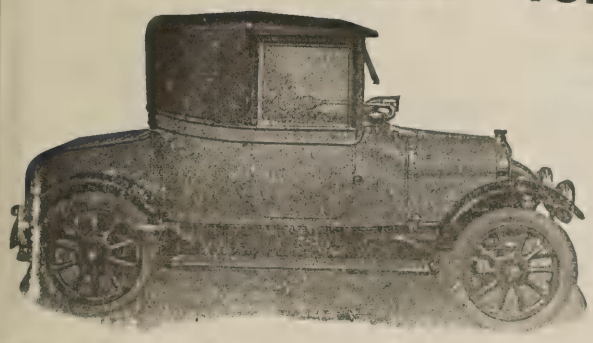

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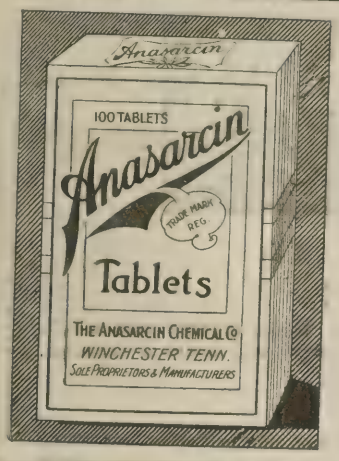

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Antikamnia Tablets

Strongly Recommended in:

INFLUENZA & LA GRIPPE

For the headache, pain, and general soreness give a five-grain Antikamnia Tablet crushed with a little water; if the pain is very severe two tablets should be given. Repeat every 2 or 3 hours as required. One single ten-grain dose is often followed by complete relief.

NEURALGIA

In the Treatment of Neuralgia and Myalgic Pains Antikamnia Tablets are not only palliative, but, along with other measures, assist in ultimate cures; they also have a field of use in Rheumatic and Gouty Affections. In Neurasthenia, Hysteria, and Migraine they are a valuable adjuvant to the other recognised therapeutic measures.

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Frequently remains after an attack of La Grippe, and has been found stubborn to yield to treatment. There is an irritation of the larynx, huskiness, and a dry and wheezing cough, usually worse at night. The prolonged and intense paroxysms of coughing are controlled by **ANTIKAMNIA & CODEINE TABLETS,** and with the cessation of the coughing the laryngeal irritation subsides.
Antikamnia Tablets are the least depressing of all the drugs that can exercise so extensive a control of pain, and also least disturbing to the digestive and other organic functions.

Analgesic. Antipyretic. Anodyne.

Antikamnia Preparations in 1-oz. packages only.

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VOLUNTARY TESTIMONY

To the Skin Value of

SAPON SOAPS

from members of the Medical and Nursing Professions

TESTIMONIALS

A HARLEY STREET DOCTOR writes:

"I have found Sapon Soap most effective in 'Clearing' a muddy, greasy skin. In one particular case in which I advised its use, the result was very striking—a healthy pink complexion replacing a dull muddy one."

A DUBLIN DOCTOR writes:

"My daughter suffers from chronic seborrhœa of the arms, and this Soap has almost completely cured her. I look on it as a most valuable preparation in such cases, and have recommended it to several prominent medical men, who speak highly of it."

A LANCASHIRE DOCTOR writes:

"As I was suffering from a very irritable urticaria rash at the time I immediately set to work with the Russian Tar Soap, and I am glad to tell you that I have already experienced much relief."

A CHESHIRE DOCTOR writes:

"I find it admirable for sensitive and irritable skin, the result of Eczema, and will have great pleasure in recommending it."

A DROITWICH DOCTOR writes:

"I have given your Russian Tar Soap tablet you sent me a full testing in accordance with the printed instructions, and am pleased to assert it an admirable detergent, almost fascinating in its use and highly economical. It ought to command great success."

A NURSE at one of the principal Hospitals writes:

"It is really wonderful how it cleans up skin trouble, especially Eczema."

A MEDICAL NURSE writes:

"A little while ago I sent for one of your free samples of soap to try on a patient who had a very greasy skin. In the meantime I got a baby who showed every sign of soreness. I tried the very best of powders and creams. Last week I tried your soap and in two or three days baby was almost better, but we did not know whether it was the soap or the thick (pure) cream I was using until we went away for the day and had to use another soap. In the evening baby was very restless and red, and the next morning the whole trouble had returned; it is now settling down again nicely through the use of your Russian Tar Soap. Our water here is very hard, and I have passed on your other sample to another lady.

I felt I ought to thank you for the samples, for I should have been very grieved to have left a sore baby, yet I thought I had tried everything."

SAPON SOAPS are Entirely Different from all other Soaps

Free lather in any water. No scum which irritates the skin. Stops irritation from insect-bites and heals open wounds. Vermin will not touch skins washed with wonderful Russian Tar Soap.

Free samples will be sent to any member of the Medical Profession on application to

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or

Glyco-Heroin (Smith)

Glykeron and Glyco-Heroin (Smith) are synonymous appellations and are now known as such to all dispensing pharmacists.

GLYKERON is a transparent liquid of heavy density, amber color, agreeably aromatic odor, and pleasant taste. As a pharmaceutical product it is perfect, in that it is agreeable, effective, and absolutely stable, offering a therapeutic activity that is not impaired by either age or climatic changes.

As a respiratory sedative and cough-allaying agent, it is most potent and trustworthy.

It affords unvarying results that can not be expected from extemporaneously prepared mixtures obtained through ordinary sources. It is the form in which the concerted influence of its several constituents on the respiratory system finds the most pronounced expression. It stimulates respiration, increases the fullness of inspiration and expiration, promotes the liquefaction of mucus, facilitates expectoration, and relieves pain.

It is particularly valuable in the treatment of cough, bronchitis, laryngitis, phthisis, pneumonia, whooping-cough, asthma, and inflammatory disorders of the respiratory tract.

The superiority of the preparation is evidenced by the extensive use made of it by physicians in all parts of the world.

Composition.

GLYKERON embraces the most active antispasmodic, balsamic, and expectorant agents. Its heroin content is one-half grain to each fluid ounce.

Dosage.

The adult dose of GLYKERON is one teaspoonful every two hours, or at longer intervals as the individual case requires. For children of ten years or more, the dose is from one-quarter to one-half teaspoonful; for children of three years or more, five to ten drops.

GLYKERON is obtainable, for dispensing purposes, in bottles of the following sizes only, and is not, under any circumstances, supplied in bulk or other form—

Large Size - - - -	16 fluid ounces each.
Small Size - - - -	3 fluid ounces each.

Sole British Agents :—
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Phenoquin

(Southall)

The Original British Substitute for Atophan

Introduced in 1917

PHENOQUIN (*Southall*) chemically is 2-phenyl-quinolin-4-carboxylic acid (or phenyl cinchoninic acid), and was the first British representative of the pre-war **German Atophan.**

In the elimination of uric acid from the system, Phenoquin is specific.

Administered in acute gout, the attack is soon cut short, especially if the treatment is commenced at the first onset of pain. In chronic gout, too, and other forms of Arthritis, Phenoquin has proved most efficacious, rapidly increasing the amount of uric acid excreted.

Phenoquin has also proved of value in acute articular rheumatism and sciatica, and other indications for its use will present themselves constantly.

The dosage indicated is from 5 to 15 tablets daily (each containing 0·25 gramme, corresponding to a daily dose of 20 to 60 grains, or approximately 1 to 4 grammes.

A London Physician writes in the "British Medical Journal" *(Aug. 25th, 1917):—*

"'Atophan' (the composition of which is stated to be 2 phenylchinolin 4 carbonic acid) eliminates uric acid, as shown a few hours after the first dose. The symptoms at once diminish, and soon disappear, as does the excess of uric acid on continuing the treatment. *This week the first consignment of a British substitute has reached me. I tested the preliminary sample and found it innocuous and effectual."*

The same Physician writes as under at a recent date:—

"I have distributed 30,000 tablets so far and have had no failure in good results."

In Bottles of 50 tablets, 6/-; 100's, 11/- each.

Neo-Phenoquin

(Southall)

NEO-PHENOQUIN *(Southall)* is the lithium salt of 2-phenyl-quinolin-4-carboxylic acid (or phenyl cinchoninic acid) and has been introduced as a British improvement on the pre-war German Atophan.

Like Phenoquin it is specific in the elimination of uric acid from the system, but possesses the advantage of more immediate action owing to its solubility, and also that of a diminished tendency to set up any renal irritation.

THE DOSE IS THE SAME AS PHENOQUIN.

A London Physician writes:— **"There is no doubt of the unique efficacy of the tablets. My friends and myself find unfailing success in their action."**

In Bottles of 50 tablets, 7/6; 100's, 14/- each.

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ORGANO-THERAPEUTICS

"Armour"

Quality with Reliability

THERE is no secret in the manufacture of Armour products. We claim, however, that all the Organo-Therapeutic preparations sold under the Armour label possess the highest quality with utmost reliability.

The opportunity of producing a superior article is ours, because we are in the position to handle enormous quantities of the raw material from which these preparations are made, before any deterioration can take place. In this advantage we are unique. The Armour Laboratory, situated in the largest abattoir in the world, is able to select only the very best raw material necessary for this work. It is also able to deal with this material without loss of time. For instance, in making GLYCEROLE OF PEPSIN we can treat the stomach of the animal with Glycerine while still warm, which results in a preparation that cannot be approached when made from isolated Pepsin.

Every Medical Man when prescribing these preparations should always specify "ARMOUR" on his prescription. He is thus sure of getting quality, reliability, and standardised dosage.

Preparations Indicated for Use in Digestive Disturbances.

Parotid Substance "Armour"
Pepsin "Armour."
Lactated Pepsin "Armour."
Elixir of Enzymes "Armour."
Diastase "Armour."
Duodenin (Duodenal Substance) "Armour."
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Trypsin Powder "Armour."
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containing Iodine in its most active condition. In all forms it is stainless, non-irritant, and avoids the disadvantages of Potassium Iodide and of Tincture of Iodine. It is prepared as:—1. Aqueous; 2. Pasta; 3. Oil; 4. Ointment. Indications: **Rheumatism, Tuberculosis, Syphilis, Asthma, Eczema,** and other **Skin** affections, and **Chilblains.**

DOSE: 1 to 3 teaspoonfuls in water after meals, three times daily.

COLLOSOL FERROMALT

A combination of Pure Malt Extract with Colloidal Iron, rich in protein, diastase, and vitamines—the essentials for perfect carbohydrate metabolism. In this colloidal suspension Iron does not cause constipation or digestive troubles.

COLLOSOL FERROMALT with HYPOPHOSPHITES.

COLLOSOL FERROMALT with GLYCEROPHOSPHATES.

DOSE: 1 to 4 teaspoonfuls, according to age, in water after meals.

COLLOSOL ARGENTUM

A non-toxic and non-irritant colloidal silver germicide and antiseptic, for general use, by topical application, injection and internal administration. Indications: Septic and infective **Wounds, Influenza, Tonsillitis, Hæmorrhoids, Cystitis, Colitis, Gonorrhœa, Diarrhœa, Bacillary Dysentery,** and affections of the **Throat, Nose, Ear,** and **Eye.**

DOSE: 1 to 2 teaspoonfuls in water, twice daily, fasting.

THE ORIGINAL COLLOIDAL PREPARATIONS FOR MEDICINAL USE.

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Collosols are pure and stable colloidal solutions, isotonic and isomorphic with the elements of the body.

Collosols are tested by ultra-microscopic, bacteriological, and clinical experiment.

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COLLOSOL SELENIUM

A colloidal suspension of Selenium, for intramuscular injection. For use in cases of inoperable Carcinoma, &c. (Vide *British Journal of Surgery*, July, 1920, p. 50.)

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A colloidal suspension of Copper, for intramuscular injection. For use in cases of inoperable Carcinoma, &c.

COLLOSOL SULPHUR

A colloidal sulphur suspension for internal administration and for use as baths, as Cream or as Oil. In this form taken internally the sulphur is entirely absorbed and avoids intestinal irritation.

DOSE: 1 to 3 teaspoonfuls with water, during or after meals.

COLLOSOL ZINC CREAM

Non-greasy and non-irritant. Cremor Collosol Zinci being in the colloidal state, the zinc, on account of the infinite subdivision of the particles, has considerable penetrative power, particularly if the cream be applied and then gently rubbed in.

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CONTAINS THE ACTIVE PRINCIPLES OF THE THYROID, PARATHYROID, OVARY, TESTIS & PITUITARY GLAND SUBSTANCES :: ::

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IN TUBERCULOSIS

"BYNOL"

To maintain body weight and generally to promote nutrition in Incipient Phthisis & Wasting Disease

"Bynol" is a combination of Cod-Liver Oil and Malt Extract, having exceptional nutritive power. The Oil used in its manufacture is a pure product, in the preparation of which Messrs. Allen & Hanburys have been directly engaged for over half a century at Lofoten and Söndmör, Norway. Medical reports show that it is one of the best weapons for arresting loss of weight and increasing capacity for assimilation.

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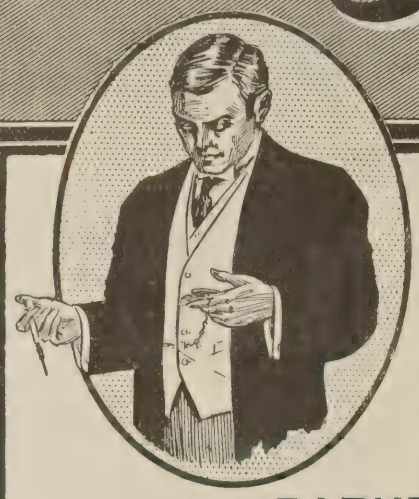
Five Seconds by the Watch



PHYSICIANS do well to be particular as to the character of the hypodermic tablets they use. A tablet that dissolves promptly and thoroughly is essential. Mere disintegration will not suffice. Many hypodermic tablets "go to pieces" in water—fine, undissolved particles settling to the bottom. Such tablets are worthless in an emergency.

PARKE, DAVIS & Co.'s HYPODERMIC TABLETS

dissolve freely and fully, forming a clear solution, without residue. *Test one by the watch!* Drop the tablet into a syringe partly filled with lukewarm water. Shake vigorously. In five seconds (or less) it will have dissolved completely. *Try it!*

PARKE, DAVIS & Co.'s HYPODERMIC TABLETS are made from *standardised drugs* only, by a process which ensures absolute accuracy of dosage and the exclusion of impurities and germ infection.

A Selection from the list of Parke, Davis & Co.'s Hypodermic Tablets.

Aconitine (alkaloid), gr. 1-120.
Adrenalin, gr. 1-200 and 1-65.
Adrenalin and Benzamine (Eucaine).
Adrenalin and Cocaine.
Apomorphine Hydrochloride, gr. 1-20 and 1-10.
Apomorphine and Strychnine.
Arecoline Hydrobromide, gr. 1-100.
Atropine (alkaloid), gr. 1-150.
Atropine Sulphate, gr. 1-200, 1-150, 1-120, 1-100, 1-60 and 1-50.
Atropine and Strychnine.
Benzamine (Eucaine) Hydrochloride, gr. 1-4.
Caffeine, gr. 1-2.
Cocaine Hydrochloride, gr. 1-8, 1-6, 1-4 and 1-2
Codeine, gr. 1-8.
Codeine Phosphate, gr. 1-4 and 1-2.
Coniine Hydrobromide, gr. 1-8.
Corrosive Sublimate, gr. 1-100.
Diamorphine (Heroin) Hydrochloride, gr. 1-24, 1-12, 1-6 and 1-4.
Digitalone, gr. 1-10, 1-2 and 1.
Emetine Hydrochloride, gr. 1-6, 1-3, 1-2 and 1.
Ergotinine Citrate, gr. 1-100.
Hyoscine (Scopolamine) Hydrobromide, gr. 1-450, 1-200, 1-150 and 1-100.
Hyoscine and Morphine.
Hyoscine Compound (Hyoscine, Atropine and Morphine).
Hyoscyamine (alkaloid), gr. 1-100.
Local Anæsthetic (Dental) (Cocaine, Morphine and Atropine).
Morphine Hydrochloride, gr. 1-8, 1-4 and 1-2.
Morphine Meconate, gr. 1-4 and 1-3.
Morphine Sulphate, gr. 1-12, 1-8, 1-6, 1-5, 1-4, 1-3, 3-8 and 1-2.
Morphine Tartrate, gr. 1-4.
Morphine and Atropine (fifteen different combinations).
Morphine and Strychnine.
Nitroglycerin (Trinitrin), gr. 1-200 and 1-100.
Nitroglycerin and Strychnine.
Physostigmine Sulphate, gr. 1-100.
Picrotoxin, gr. 1-50.
Pilocarpine Hydrochloride, gr. 1-8 and 1-6
Pilocarpine Nitrate, gr. 1-4 and 1-3.
Quinine Acid Hydrochloride, gr. 5.
Quinine and Urea Hydrochloride, gr. 7-10 and 2.
Scopolamine Hydrobromide, see Hyoscine.
Scopolamine and Morphine.
Sodium Chloride, Pure, gr. 1-7.
Sparteine Sulphate, gr. 1-30, 1-10 and 1-4.
Strychnine Formate, gr. 1-60.
Strychnine Hydrochloride, gr. 1-60.
Strychnine Nitrate gr. 1-100, 1-60, 1-40 and 1-20.
Strychnine Sulphate, gr. 1-150, 1-100, 1-60, 1-50, 1-40, 1-32 and 1-30.

For formulæ of the compound tablets, also prices and packages, see price list.

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Rich in Diastase.

"MALTINE"

Rich in Phosphates and Proteids.

Professor CHITTENDEN (Yale University) reports:—

"The results demonstrate conclusively the far greater diastasic value of your preparation, and enable me to state, without any qualification whatever, that 'MALTINE' far exceeds in diastasic power any of the preparations of malt which I have examined."

THE LANCET says:—

"'MALTINE' exhibits in an eminent degree the starch-dissolving power of diastase; in fact, a teaspoonful is capable of converting instantaneously a surprising amount of stiff starch paste into a thin limpid liquid."

"**MALTINE**" is readily distinguished from other extracts of malt by its agreeable flavour, convenient consistence, and attractive colour. Its **diastasic** strength, richness in reconstructive constituents, and easy assimilability are the **facts** which explain its use by medical men.

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(1) **As a nutrient in feeble nutrition and wasting disease.**

(2) **As a starch digestant to aid feeble amylaceous digestion.**

(3) **In fever and milk diets, to supplement nutrition and to prevent coarse curdling.**

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"MALTINE" with COD LIVER OIL.

The "BRITISH MEDICAL JOURNAL" states:

"Apart from its own dietetic value, 'MALTINE,' when combined with Cod Liver Oil, certainly enables the latter to be taken by persons who can neither swallow nor assimilate it in any other form."

"**Maltine**" **with Cod Liver Oil** is Absolutely Palatable, and contains a satisfactory proportion—30 per cent. by volume—of Cod Liver Oil, is easily digested and possesses a high Food Value.

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Each Fluid Ounce contains Pure Beechwood Creosote 4 minims.

"MALTINE" is a very useful vehicle for the administration of this pungent and acrid drug, its Palatability making it an admirable corrective, while its beneficial influence on nutrition and digestion supports the action of the Creosote.

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Each Fluid Ounce contains—

IRON PYROPHOSPHATE ... 8 grains.

This is a particularly bland and assimilable preparation of Iron, in which the astringency of the ferruginous salt is counteracted by the slightly laxative action of the "MALTINE" base, which stimulates nutrition, aids digestion, and furnishes the blood with immediately available proteids and other food elements.

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The Advantages of Virolax

The New Nutrient Laxative.

Perfect emulsification of the Paraffin so that its uncertain action is avoided.

The administration of an easily digested food with a bowel lubricant, without overloading the already distended intestine.

Complete lubrication of the bowel directly facilitating the progress of the intestinal contents and inhibiting undue bacterial growth and the production of microbic toxins.

The most pleasant laxative available. Attractive in appearance, agreeable in flavour, and will appeal to the most fastidious patients, whilst children take it readily.

Virolax

(Registered Trade Mark.)

In Tins: 1/-, 2/8.

VIROL LTD., 148/166, Old Street, London, E.C.1.

PIONEERS AND EMPIRE BUILDERS: No. 66
SECOND PERIOD, 500,000 *(speculative)* to circa 8000 B.C.

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Enable fresh antiseptic solutions of any precise strength to be made in a moment without weighing.

You simply dissolve them in the required amount of water.

'SOLOID' Antiseptics include suitable strengths of all regularly-used agents: a few examples are here given.

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gr. 1·75 *tubes of* 25
do. *bottles of* 100
gr. 4·37 ,, ,, 25
do. ,, ,, 100
gr. 8·75 ,, ,, 25
do. ,, ,, 100

'SOLOID' Corrosive Sublimate

gr. 1·75 *bottles of* 100
gr. 8·75 ,, ,, 25
do. ,, ,, 100
gr. 17·5 ,, ,, 25
do. ,, ,, 100

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gr. 6 *bottles of* 25
(Otto of rose scented)
gr. 15 *bottles of* 50

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gr. 5 *tubes of* 25
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gr. 60 ,, ,, 6

See also Wellcome's Medical Diary

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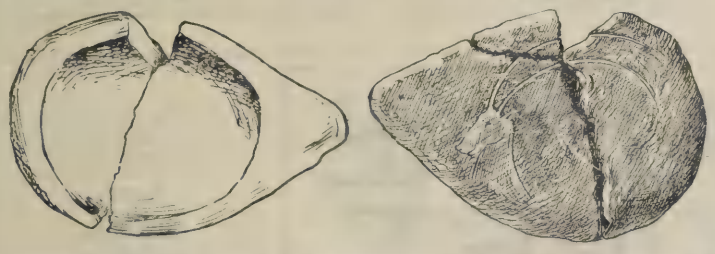
LAMP DEVISED AND ONCE USED BY THE EARLIEST PIONEERS OF ARTIFICIAL LIGHTING.—How the Magdalenian cave artists worked in remote galleries and recesses into which the light of day never penetrated was for a time one of the mysteries which made it difficult to believe that the paintings there discovered were their work. The finding of the primitive lamp here reproduced—with several other specimens later—led to the solution of the problem. It consists of a large hollow pebble of fine limestone. When discovered it still contained traces of carbonaceous matter which, in the opinion of a distinguished analyst, had resulted from the combustion of animal fat. This fat would provide the oil, and it is considered that, like the Eskimos (one of whose lamps is here reproduced on the right for comparison), the Magdalenians would use a piece of moss for the wick. Such a lamp, carefully kept, would give off very little smoke, and experiment has proved that any trace of smoke left upon the walls would soon fade off, this would satisfactorily explain away the objection that no traces of smoke are found. The base of the lamp is engraved with the head and horns of an ibex, which resembles one engraved upon a wall of the cave in which it was found.



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ANTIPYRETIC & ANALGESIC.

Supersedes Antipyrin, Phenacetin and Pyramidon.

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Indicated in:—

ANÆMIA, CHLOROSIS, GENERAL DEBILITY, GRAVES' DISEASE, TUBERCULOSIS, and all ATONIC CASES.

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IS THE SAFEST OF ALL ARSENICAL COMPOUNDS IN

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"I have introduced Galyl up here (Burma). I consider no tropical clinic is complete without it."—Dr. J. P. W., M.R.C.S., L.R.C.P., D.P.H.Lond.

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MEDICAL EXHIBITION

Organised by the Management of the Exhibitions of the 17th International Congress of Medicine, 1913 and the Clinical Congress of Surgeons, 1914

THE CENTRAL HALL

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The attendance is strictly confined to the Profession, and the public are not admitted. Last year the Exhibition was visited by several thousand Doctors.

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Invitation Cards will be sent to every member of the Profession residing within a 50 mile radius of the Hall. Those in the Provinces who do not receive cards, desiring to visit the Exhibition, can obtain same on application to The Secretary, 194-200, Bishopsgate, London, E.C., or at the Box Office during the Exhibition week.

PRESS OPINIONS *of the* 1919 EXHIBITION.

The "Lancet."

"After a lapse of six years the ninth London Medical Exhibition was opened at the Central Hall, Westminster on October 6th, remaining open until to-day (Friday, October 10th). Former exhibitions organised and conducted under the same auspices, were held in the Horticultural Hall, Vincent Square. The drug instrument, and book trades were well represented at the exhibition, especially when there are taken into consideration the difficulties of transport and the general dislocation of business due to the recent strike. The exhibition proved of particular interest in showing the numerous and important advances made in this country, chiefly in the manufacture of chemical and pharmaceutical products and antiseptics during the period of the war. Preparations were to be found in good number, demonstrating agreeably how British manufacturers have risen to the occasion and have now established their laboratories and factories as reliable and adequate sources of supply of many products hitherto exclusively obtained from abroad. The arsenical synthetics, aceto-salicylic acid, peptone for bacteriological work, and drugs in colloidal state, may well be described as vindications of British powers of research and application. The demonstration served to show also how professional in character were the products, for the organisers have always made a point of keeping the exhibition exclusive to the medical visitor. Medical men found themselves able to spend a good deal of time in making a serious review of the exhibits, for the exhibition proved a real demonstrative centre of new things in medicine and in surgery."

"The Times."

"The ninth London Medical Exhibition was opened yesterday at the Central Hall, Westminster. As the first of these exhibitions to take place since the war, it excited a great deal of interest. All the large British producing firms have stalls in the exhibition, and the advances made during the war, in both surgery and medicine, are illustrated. In addition a large number of new products are on view."

"The Daily Telegraph."

"The great war has done much to emancipate humanity, British and other, from dependence upon Germany. Two conclusions the visitor to the London Medical Exhibition, which is open this week at the Central Hall, Westminster, will inevitably bring away with him. One is that the average Englishman has been sadly lacking in acknowledging the debt that he owes to scientists of his own nationality. The second is that there is little for which we need now lean upon the German. There has been no Medical Exhibition since 1913. Six years' concentrated effort at beating the German at his own game, when necessity drove us to it, was bound to tell, and many of the stalls have their greatest display of preparations of British make throughout for which there is no longer any call to go abroad."

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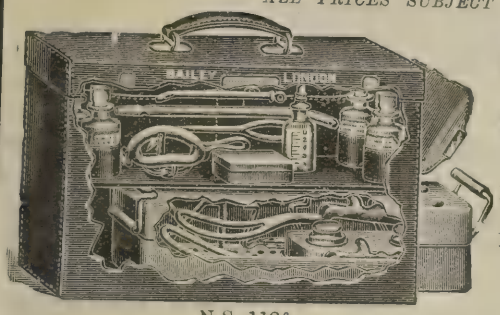

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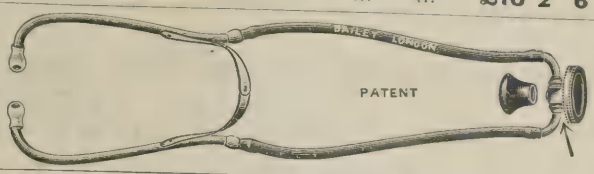

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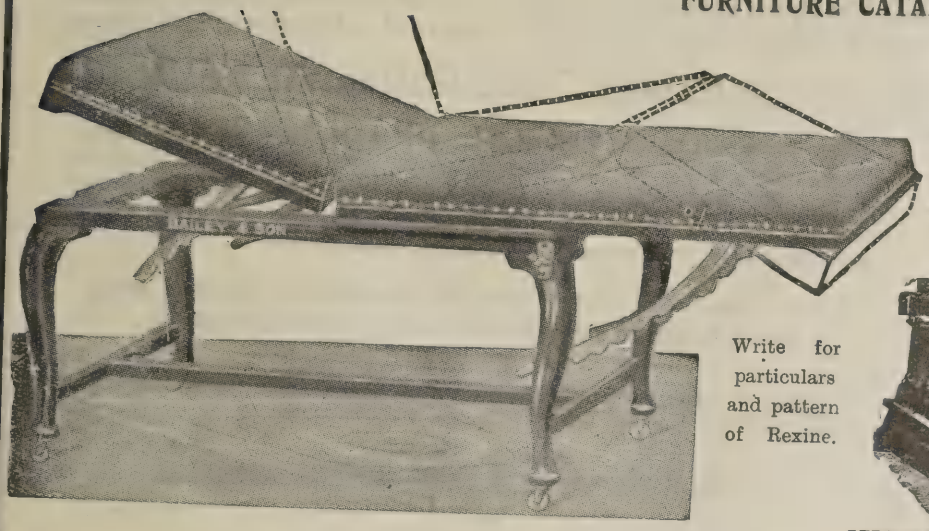

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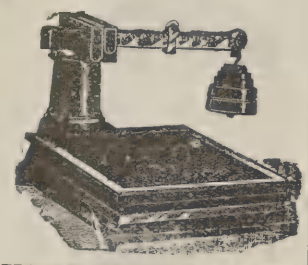

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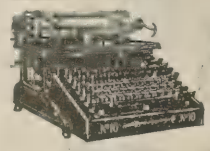

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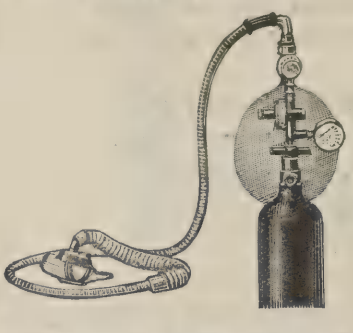

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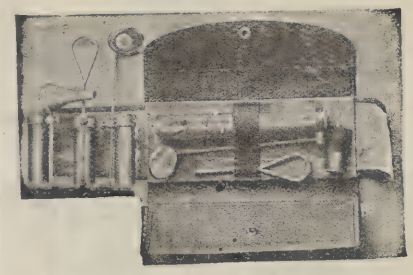

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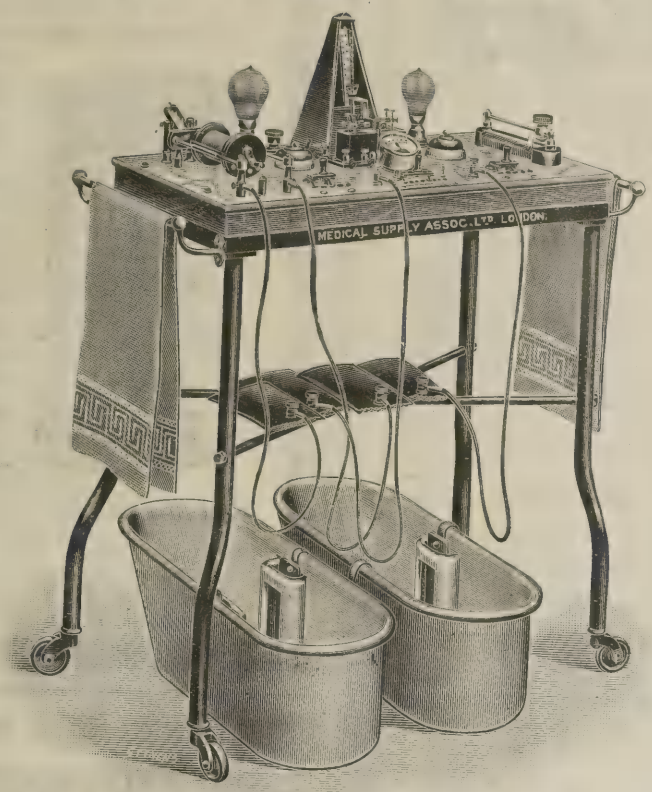

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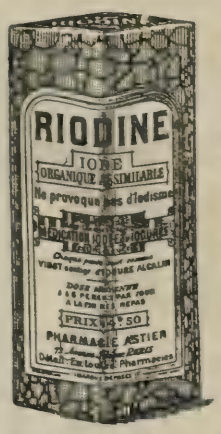

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The Right Hon. the Viscount HAMBLEDEN will Preside.

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Two Lectures on "ENLARGEMENT OF THE PROSTATE,"
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For terms, please apply to the Medical Superintendent.

Grove House, All Stretton, Church STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Care and Treatment of a limited number of Ladies Mentally Afflicted.

Climate healthy and bracing.

Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

Samaritan Free Hospital for Women, Marylebone-road, N.W. 1.—Applications are invited for the post of HOUSE SURGEON, salary at the rate of £150 per annum, commencing 1st November, 1920. Previous experience as House Surgeon essential. Applications, accompanied by copies of testimonials, should reach the Secretary, at the Hospital, on or before October 11th.

G. H. HAWKINS, Secretary.

The Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—HOUSE SURGEON for Casualty duty required on 1st November. Six months' appointment. Salary £100 per annum, with board, residence, and washing. Candidates (Men or Women) must possess a Medical and Surgical qualification.

Applications, with copies of testimonials, should be sent on or before 4th October, to T. GLENTON KERR, Secretary.

Telephone: Dalston, 305. Sept. 3rd, 1920.

University College Hospital Surgical UNIT.—THIRD ASSISTANT required. Salary £300. Appointment for one year, eligible for re-election.

Applications to be sent in by the 9th October to the Dean, University College Hospital Medical School, University-street, W.C. 1.

The Prince of Wales's General HOSPITAL, Tottenham, N. 15.—Applications are invited for the following posts, vacant on the 15th October next:—

HOUSE PHYSICIAN. £200 per annum.
HOUSE SURGEON. £200 per annum.
JUNIOR HOUSE SURGEON. £120 per annum.
JUNIOR HOUSE PHYSICIAN. £120 per annum.

With residence, board, and laundry.

The appointments are from 15th October to 15th April, 1921.

Candidates (male) must be duly qualified and registered, and applications, together with copies of three recent testimonials, to be sent to me on or before Tuesday, the 28th September next.

September 7th, 1920. FREDK. W. DREWETT, Director.

The Metropolitan Asylums Board invite applications for appointment as JUNIOR ASSISTANT MEDICAL OFFICERS in the Infectious Hospitals Service. Candidates must be unmarried, and must be duly registered and qualified by law to practise both Medicine and Surgery in England. Junior Assistant Medical Officers are subject to annual re-election. Salary £515 6s. per annum (including war bonus). Assistant Medical Officers are required to reside in the Institutions. The charge for board, lodging, and washing is £130 per annum. The remuneration is subject to statutory deduction under the provisions of the Poor-law Officers' Superannuation Act, 1896.

Forms of application may be obtained from the Clerk to the Metropolitan Asylums Board, Embankment, E.C. 4, and must be returned to him as soon as possible.

City of London Hospital for Diseases OF THE CHEST, Victoria Park, E.2 (rail, bus, and tram, Cambridge Heath, G.E.R.).—TUBERCULOSIS OFFICER.—The Committee of the Hospital are about to appoint a Junior Tuberculosis Officer in connexion with the Tuberculosis Dispensary for the Metropolitan Boroughs of Bethnal Green and Hackney. The Dispensary is under the control of the Hospital, with the exception of such administrative control as devolves on the Medical Officers of Health of each Borough.

Applicants must have held a resident appointment in a General Hospital and have had special experience of Diseases of the Chest and of Public Health work. Age not exceeding thirty-five. Salary at the rate of £600 per annum, with lunch and dinner provided, according to hours of duty. The officer will be required to devote his whole time to the duties of the office. The appointment will be determinable by three months' notice on either side.

Candidates are requested to send their applications, accompanied by copies of not more than three recent testimonials, to the undersigned on or before Monday, 18th October, 1920. Canvassing of the members of the Committee of Management (except members of the Medical Staff) is prohibited. GEORGE WATTS, Secretary.

The Hospital for Sick Children, Great Ormond-street, London, W.C. 1.

The following appointments will shortly be vacant:—

NON-RESIDENT.

CASUALTY MEDICAL OFFICER—7th October, 1920.

RESIDENT.

ASSISTANT CASUALTY MEDICAL OFFICER—14th October, 1920.
HOUSE SURGEON—14th October, 1920.
HOUSE PHYSICIAN—1st November, 1920.

Candidates are invited to send in their applications, addressed to the Secretary, before 12 o'clock on Monday, 4th October, 1920, with copies of not more than three testimonials given specially for the purpose, and also evidence of their having held a responsible hospital appointment.

The non-resident appointment is made for twelve months, but may be held subject to re-election for a period of three years. Salary £200 per annum, with luncheon.

The resident appointments are made for six months. Salary £50, laundry allowance £2 10s., and board and residence in the Hospital.

Candidates must be unmarried and possess a legal qualification to practise.

All candidates must appear before the Joint Committees at their meeting on Wednesday, 6th October, 1920, at 5 P.M. precisely.

Forms of application and copies of the rules may be obtained from the Secretary.

By order of the Committee of Management.

September, 1920. JAMES MCKAY, Acting Secretary.

Royal Eye Hospital, St. George's Circus, S.E.1.—SENIOR and JUNIOR HOUSE SURGEONS required. Salaries—Senior £100, Junior £75, with board and residence. Appointments for six months, renewable. Applications, with testimonials, to Secretary not later than October 8th. There are also vacancies for CLINICAL ASSISTANTS (unpaid). 56,000 attendances in O.P. Department annually.

Third Resident Medical Officer for General Work in Main Hospital, &c. Doubly qualified. Commencing £200, all found. Bachelor's quarters. Reply, in first place, enclosing copies of three recent testimonials, to Secretary, A. V. HOSPITAL, BATTERSEA GENERAL HOSPITAL (Incorporated), Battersea Park, S.W. 11.

The Cancer Hospital (Free) Fulham-road, London, S.W. 3.—The Committee are prepared to receive applications for the post of HOUSE SURGEON. Salary £150 per annum.

The appointment is for six months and subject to rules, a copy of which may be obtained from the Secretary.

Women Graduates are eligible.

Applications, with copies only of three testimonials, to be sent to the undersigned immediately. J. COURTNEY BUCHANAN, Secretary.

East London Hospital for Children and DISPENSARY for WOMEN, Shadwell, E. 1.—Application are invited for the post of HOUSE SURGEON.

The appointment is for six months from October 1st.

Also for the post of HOUSE PHYSICIAN vacant during October.

Board, residence, and laundry are provided.

Salary at the rate of £125 per annum. Applications, with testimonials, to be sent to the undersigned not later than Monday, September 27th. W. M. WILCOX, Secretary.

Hospital for Consumption and DISEASES of the CHEST, Brompton, S.W.—The Committee of Management invite applications for the post of ASSISTANT ANÆSTHETIST to the Hospital. Candidates, who must be registered Medical Practitioners, are requested to send in applications and testimonials not later than Thursday, 21st October, 1920.

Honorarium £25 per annum.

Brompton, September, 1920. FREDERICK WOOD, Secretary.

Hospital for Consumption and DISEASES of the CHEST, Brompton, S.W.—The Committee of Management invite applications for the post of ASSISTANT RESIDENT MEDICAL OFFICER. Candidates, who will be required also to undertake the duties of a House Physician, must be registered Practitioners, and must have held a resident Hospital appointment for six months. Salary £150 per annum, with board and residence.

Applications, with testimonials, to be sent in on or before 21st October 1920.

Brompton, September, 1920. FREDERICK WOOD, Secretary.

St. Mary's Hospital for Women and CHILDREN, Plaistow, London, E. 13. — The Committee of Management invites applications for the position of HONORARY SURGEON to the Out- and In-patients' Departments.

Candidates must be Fellows of the Royal College of Surgeons, England, or must obtain such qualification within twelve months of the appointment.

For further particulars apply to the undersigned, to whom applications, accompanied by three recent testimonials, must be sent not later than Wednesday, October 6th.

20th September, 1920. A. ERNEST WILKES, Secretary.

Westminster Hospital, opposite Westminster Abbey, S.W. 1.—Applications are invited for the office of PHYSICIAN or SURGEON for Diseases of the Skin. Gentlemen desirous of becoming candidates must be Fellows or Members of the Royal College of Physicians of London, or Fellows of the Royal College of Surgeons of England. Each candidate will be required to transmit a certificate of his age, and to attend the House Committee with his testimonials on Tuesday, the 12th day of October, 1920, at a quarter past 4 o'clock. By order of the House Committee.

SIDNEY M. QUENNELL, Secretary.

Montrose Royal Asylum.—Wanted, ASSISTANT MEDICAL OFFICER, Male, unmarried. Salary £350 per annum, without deductions, with board, lodging, and laundry.

Applications, stating age and qualifications, with testimonials, to be sent to the Medical Superintendent.

Carnegie Dunfermline Trust.—Applications are invited for the post of ASSISTANT MEDICAL OFFICER to the Carnegie Dunfermline Trust. The duties include Medical Inspection in Dunfermline Schools, Treatment of School Children at the School Clinic, and Lecturing in Dunfermline College of Hygiene and Physical Education.

Applicants must be fully qualified in Medicine and Surgery, and a qualification in Public Health will be a recommendation. The salary is £500 per annum.

Copies of recent testimonials and a statement of age, qualifications, and experience, should be lodged with the Secretary, Offices of Carnegie Dunfermline Trust, Abbot-street, Dunfermline, as soon as possible.

9th September, 1920.

Assistant Medical Officer wanted at once for the GLASGOW DISTRICT MENTAL HOSPITAL, at Gartloch, Gartcosh. Salary £350, with board and lodgings. Apply, stating age, experience, and degree, and with references or copies of recent testimonials to Medical Superintendent.

Crichton Royal, Dumfries.—Assistant PHYSICIAN, man, unmarried, fully qualified and registered. Salary £350 a year, with board, lodging, and laundry. Asylum experience unnecessary. Well-equipped laboratories and other facilities for original work. No deductions from salary for pension or other purposes. Appointment terminable on three months' notice. Apply in writing, stating age, qualifications, and experience, with copies of testimonials, to Physician-Superintendent, Crichton Royal Mental Hospital, Dumfries.

University of Aberdeen.

LECTURESHIP IN BACTERIOLOGY.

Applications are invited for the post of Lecturer in Bacteriology within the Department of Pathology.

Salary £600 per annum.

Federated Superannuation System for Universities compulsory.

Applications, together with full statement of qualifications, age, and copies of not more than three testimonials, to be lodged with the Secretary of the University, Marischal College, Aberdeen.

H. J. BUTCHART, Secretary.

Aberdeen Royal Infirmary.—Wanted for the Treatment Centre at the Aberdeen Royal Infirmary, under "The Public Health (Venereal Diseases) Regulations (Scotland), 1916," a Whole-time JUNIOR MEDICAL OFFICER (Male). Candidates must have had experience in the Specialty, and be prepared, if required, to render assistance with the work generally throughout the Area falling within the Centre, and in the instruction of Medical Students and Practitioners in diagnosis and treatment.

Salary £500 per annum.

Any further particulars desired may be had from the undersigned, with whom applications (stating experience) and testimonials—fifteen copies of each—have to be lodged on or before 30th September current.

A. SCOTT FINNIE, Clerk and Treasurer.

343, Union-street, Aberdeen.

Hulme Dispensary, Dale-street, Stretford-road, Manchester.—Wanted, a HOUSE SURGEON of British descent, duly registered, and fully qualified. Salary £400 per annum, with apartments, attendance, coal and gas.

Applications, with testimonials, at once to Honorary Medical Secretary.

Macclesfield General Infirmary (80 beds).—Wanted, RESIDENT HOUSE SURGEON. Salary £200 per annum, with board and residence. Applicants must have had experience in the administration of Anæsthetics, also in Refraction Eye work, for which fees may be received.

Applications, stating age, qualifications, and copies of testimonials, to be sent to the Secretary.

Wells Asylum, Somerset.—Assistant MEDICAL OFFICER required (Male). Single, must be legally qualified and registered. Previous experience not essential. Salary commencing £300 per annum, with board, lodging, washing, and attendance, subject to statutory deductions for superannuation fund.

Applications to be sent to Medical Superintendent, stating age, and with full particulars, and not more than three recent testimonials.

The Hospital for Sick Children, Newcastle-upon-Tyne.—The Committee of Management have declared vacancies for Two HONORARY ASSISTANT SURGEONS. Applications, stating age and qualifications, are invited for these appointments, and should be sent to the Secretary, Mr. NEIL BRODIE, Star Buildings, 26, Northumberland-street, Newcastle-upon-Tyne, accompanied with testimonials, on or before 9th October, 1920. Canvassing a disqualification.

Monmouthshire Asylum, Abergavenny. Wanted, a JUNIOR ASSISTANT MEDICAL OFFICER, Male, single, registered. Previous Asylum experience not necessary. Salary £350 per annum, with £25 yearly increments to £400, subject to the provisions of the Asylum Officers' Superannuation Act, 1909, with board, furnished apartments, washing, and attendance.

Applications, stating age, qualification, &c., with not more than three recent testimonials, to be sent to the Medical Superintendent.

Wigan Infirmary. — Vacancies occur for:—

An HONORARY PHYSICIAN,

An ASSISTANT HONORARY PHYSICIAN,

who must be legally registered to practise Medicine and Surgery, and reside preferably within six miles of the Infirmary.

Applications, with copies of two recent testimonials, stating age, qualifications, &c., to reach the undersigned (from whom further information can be obtained) by Tuesday, October 5th.

HEDLEY LUCAS, Gen. Supt. & Secretary.

By order of the Board of Management of the Wigan Infirmary.

Huddersfield Royal Infirmary.—Vacancies exist for Two ASSISTANT HOUSE SURGEONS. £150 each per annum) salaries, with board, residence, and laundry.

Applications from qualified and registered gentlemen to be sent, with copies of testimonials, to the Secretary, Royal Infirmary, Huddersfield.

Bedford County Hospital.—Wanted, an ASSISTANT HOUSE SURGEON, unmarried, Male. Candidates must be duly qualified to act in Medicine and Surgery. Salary £150 per annum, with board, lodging, and laundry. Applications, stating age, qualifications, medical school, and previous appointments, together with three recent testimonials, must be sent to

August 25th, 1920. BEAUCHAMP WADMORE, Secretary.

St. Mary's Hospitals for Women and CHILDREN, Manchester. — HOUSE SURGEON required for WHITWORTH PARK HOSPITAL (Gynæcological and Children) for a period of six months. Salary at the rate of £100 per annum, with board and residence. Applications, with testimonials, to be sent to the undersigned on or before the 28th inst.

R. RATCLIFFE, Secretary.

Glamorgan County Asylum, Bridgend. JUNIOR ASSISTANT MEDICAL OFFICER required. Commencing salary (after deductions according to the Asylums Officers Superannuation Act, 1909) £350, rising to £400 by annual increments of £25, with board, apartments, washing, and attendance.

Applications, stating qualifications, age, and nationality, with copies of recent testimonials, to be sent to the Medical Superintendent.

Beckett Hospital and Dispensary, Barnsley (120 beds). — SENIOR HOUSE SURGEON (Male) required 1st September. Salary £250 per annum, with board, residence, and laundry.

Candidates must be legally qualified and registered. Applications, stating age, qualifications, experience, and nationality, together with copies of three recent testimonials, to be addressed to the Secretary, Beckett Hospital, Barnsley.

South Devon and East Cornwall HOSPITAL, Plymouth (176 beds).—The Committee invite applications for the appointment of a qualified HOUSE SURGEON, to commence duties at once. Special consideration will be given to candidates who have held a similar appointment in a large hospital. Salary £200, with board, residence, and washing.

Candidates should send copies of not more than three testimonials to the undersigned.

Plymouth, 18th September, 1920. P. J. LANGDON, Secretary.

Manchester Northern Hospital for WOMEN and CHILDREN, Park-place, Cheetham Hill-road, Manchester.—The Committee of Management require the services of a duly qualified HOUSE SURGEON, to commence duties on November 1st. The administration necessitates the appointment of a male House Surgeon.

Applications, with testimonials, stating age, experience, and essential particulars, to be sent to Mr. HUBERT TEAGUE, Secretary, 38, Barton Arcade, Manchester.

The Royal Sussex County Hospital, Brighton.—ASSISTANT HOUSE SURGEON (Male) required immediately. He must hold a Medical and Surgical qualification of the United Kingdom, and be duly registered under the Medical Act. He must be unmarried, and when elected under thirty years of age. Salary £150 per annum, with board, residence, and laundry. Applications, with proof of the above qualifications, together with copies of recent testimonials, to be sent to the undersigned.

L. L. W. LANCASTER-GAYE, Secretary.

Ingham Infirmary and South Shields AND WESTOE DISPENSARY.—Wanted, a JUNIOR HOUSE SURGEON. Salary £175 per annum, with residence, board, and washing. No out-visiting. Candidates must hold registered qualifications in Medicine and Surgery. The appointment will be terminable by one month's notice. Applications, stating age, and accompanied by copies (which will not be returned) of recent testimonials, to be sent to the undersigned, from whom further particulars may be obtained.

JOHN POTTER, Secretary.

The Royal Infirmary, Sheffield (363 beds).

The Weekly Board of Management invite applications for the post of HOUSE SURGEON.

The salary attached to the appointment is £150 per annum, with board and residence.

Applications, together with copies of recent testimonials, should be addressed to

Board Room, September, 1920. JNO. W. BARNES, Secretary.

Westmorland County Education COMMITTEE and KENDAL BOROUGH EDUCATION COMMITTEE. — Wanted, Registered DENTAL PRACTITIONER (whole time), to carry out the Dental Inspection and Treatment of Elementary School Children in the County, including the Borough of Kendal, under the directions of the School Medical Officer. Salary £500 per annum, plus travelling expenses. Form of application and further details may be obtained from the undersigned.

CHAS. J. R. TIPPER, B.Sc., Director of Education.

Lowther House, Kendal, 18th September, 1920.

Kent County Mental Hospital, Maidstone.—JUNIOR ASSISTANT MEDICAL OFFICER (Male) required. Salary £300 per annum, with furnished quarters, board, and washing. Must be single.

Application should be made at once to the Medical Superintendent.

Essex County Hospital, Colchester (100 beds).—Wanted immediately, a HOUSE SURGEON (Male). Salary £200 per annum, with board, washing, and residence in the Hospital. Medical and Surgical qualifications required.

Applications, with three recent testimonials, to be sent at once to

ALFRED G. BUCK, Secretary.

Worcester County and City Mental HOSPITAL, Powick. — Wanted, a JUNIOR ASSISTANT MEDICAL OFFICER, unmarried. Salary £350, with board, furnished apartments, washing, and attendance, subject to deductions under the Asylum Officers' Superannuation Act, 1909. Apply, with copies of testimonials, to the Superintendent.

Cameron Hospital, West Hartlepool. HOUSE SURGEON (unmarried) required (42 beds). Salary £300 per annum, with board, rooms, and washing.

Applications, stating age, qualifications, &c., accompanied by two testimonials, to be sent to the undersigned.

Sept. 9th, 1920. J. G. TAYLOR, Secretary.

City of Leeds.—Appointment of an Additional ASSISTANT MEDICAL OFFICER for Maternity and Child Welfare.—Applications are invited from qualified and registered Medical Practitioners, Male or Female, for the post of Assistant Medical Officer for Maternity and Child Welfare. Applicants must have had experience in a general hospital subsequent to qualifying, and also experience in the treatment of children's diseases, either in a sick children's hospital or in wards of a general hospital set apart for children. Experience in the treatment of diseases of women and the possession of the D.P.H. would be considered additional qualifications. The salary offered is £500 per annum.

Intending candidates should apply in the first case to the Medical Officer of Health, 12, Market-buildings, Vicar-lane, Leeds, for particulars as to the duties of the appointment and for form of application.

Applications, together with copies of three recent testimonials, endorsed "Maternity and Child Welfare Officer," should be delivered to the undersigned not later than Monday, October 4th.

Leeds, 11th September, 1920. ROBERT E. FOX, Town Clerk.

Pontypridd Urban District Council.—The Pontypridd Urban District Council invite applications from fully qualified Medical Women for the position of ASSISTANT MEDICAL OFFICER, whose principal duties will be the Medical Inspection of School Children and the work of Maternity and Child Welfare, together with other duties which may be assigned to her from time to time by the Medical Officer of Health, at a commencing salary of £550 per annum, rising by annual increments of £50 to £650 per annum.

The lady appointed will be required to devote the whole of her time to the duties of the office and will not be allowed to engage in private practice, also to act under the general direction of the Medical Officer of Health.

Candidates should be competent to perform the simpler refraction work and to prescribe spectacles for School Children, the more difficult cases being referred to a Specialist. Preference will be given to candidates who have had previous experience in School and Maternity Work, and such experience in the work of Maternity and Child Welfare Centres will be considered in assessing the initial salary.

The appointment will be terminable by three calendar months' notice on either side.

Forms of application may be obtained from:

The Medical Officer of Health,
Municipal Buildings, Pontypridd,

and should reach the undersigned not later than 30th September, 1920, endorsed "Assistant Medical Officer of Health."

H. LEONARD PORCHER, Clerk to the Council.

Municipal Buildings, Pontypridd, Sept. 14th, 1920.

Worcestershire County Council.—SCHOOL OCULIST.—The above-named Council are about to appoint a School Oculist, who must be specially experienced in Eye Diseases and their Treatment, and competent to undertake the correction of errors of refraction.

The duties will be to examine and, where necessary, to treat the eyes of children in the County Schools.

Applicants, either male or female, must be registered Medical Practitioners of suitable experience and qualifications, and be between twenty-five and forty-five years of age. The person appointed will be required to reside in the district assigned to him or her by the County Council, to devote the whole of his or her time to the work, and will be subject to the directions of the County Medical Officer.

The salary will be £550 per annum, rising to £600 by two equal annual instalments, in addition to allowances for travelling and personal expenses.

Experience in motor driving is desirable.

The engagement will be subject to three months' notice on either side.

Applications (on forms to be obtained from the County Medical Officer), accompanied by not more than three recent testimonials, must be received by 12 noon on Tuesday, the 5th October, 1920, addressed to the County Medical Officer, 29, Foregate-street, Worcester, and endorsed "School Oculist."

Canvassing disqualifies, and neither the names of the County Council nor of the Committee will be supplied.

C. H. BIRD, Clerk of the County Council.

Shirehall, Worcester, 14th September, 1920.

North Devon Infirmary, Barnstaple.

Wanted on Oct. 20th, a duly qualified HOUSE SURGEON (Lady or Gentleman). Salary £200 per annum, with board, apartments, and laundry. Applications, stating age, qualifications, with copies of testimonials, to be sent in on or before Saturday, October 9th, 1920, addressed Chairman, House Committee.

City of Leeds.

LEEDS CITY HOSPITALS, SEACROFT (500 Beds).

An ASSISTANT MEDICAL OFFICER, Male or Female, who should be unmarried, is required in these Hospitals about the middle of October. The officer will be required to act under the directions of the Medical Superintendent, and to have some knowledge of ordinary bacteriological methods, and should also provide own bacteriological microscope, with 1-12th oil immersion lens.

The diseases ordinarily under treatment are those scheduled in the Infectious Diseases Notification Act.

The salary is £300 per annum, with board, lodging, washing, and attendance.

Application, with copies of recent testimonials, must be sent to the Town Clerk, Leeds, not later than Saturday, 2nd October.

18th September, 1920.

Wilts County Council.—Appointment

of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH and ASSISTANT SCHOOL MEDICAL INSPECTOR.—The Wilts County Council invite applications for the appointment of an Assistant County Medical Officer of Health and Assistant School Medical Inspector. Applicants must be fully qualified Medical Practitioners and must hold a Diploma in Public Health or an equivalent qualification. The commencing salary will be £600 per annum. The officer appointed will be required to devote his whole time to the duties of the office, and to act under the direction and control of the County Medical Officer of Health, who is also School Medical Officer. The duties of the post will be chiefly concerned with the School Medical Service, but in addition a certain amount of the officer's time will be devoted to the Public Health work of the County. The appointment will be determinable by three months' notice on either side.

Applications on form to be obtained from the undersigned, together with not more than three recent testimonials, and enclosed in envelope marked "Assistant Medical Officer," to be lodged with the undersigned not later than Saturday, the 9th day of October, 1920.

Canvassing, either directly or indirectly, is strictly prohibited, and will be regarded as a disqualification.

W. L. BOWN, Clerk of the County Council.

County Offices, Trowbridge, September, 1920.

Queen's Hospital, Birmingham.—

Applications are invited for the following Resident Appointments:—

HOUSE PHYSICIAN to serve under Dr. Kauffmann for three months ended December 31st, 1920.

HOUSE PHYSICIAN to serve under Dr. Stanley for six months ended March 31st, 1921.

HOUSE PHYSICIAN to serve under Dr. Emanuel for six months ended March 31st, 1921.

HOUSE SURGEON to serve under Mr. Leedham-Green for six months ended March 31st, 1921.

HOUSE SURGEON to serve under Mr. Billington for six months ended March 31st, 1921.

HOUSE SURGEON to serve under Mr. Nuthall for three months ended December 31st, 1920.

OBSTETRIC and OPHTHALMIC HOUSE SURGEON for six months ended March 31st, 1921.

CASUALTY HOUSE SURGEON for six months ended March 31st, 1921.

Salary in each case at the rate of £90 per annum, together with board, apartments, and laundry.

Candidates, who must be fully qualified and registered, to send in their applications, together with certificate of registration, to the undersigned.

ELLIS C. SMITH, Secretary and General Superintendent.

Birmingham Union.

MONYHULL COLONY FOR EPILEPTICS & FEEBLE-MINDED.

RESIDENT MEDICAL OFFICER.

The Guardians invite applications from duly qualified Medical Men for the appointment of Resident Medical Officer at Monyhull Colony. Accommodation—500 patients on the Adult Section, and 350 patients on the Children's Section, which is certified by the Board of Education as a Residential School under the Elementary Education (Defective and Epileptic Children) Acts. Included in the above numbers are 140 patients certified under the Mental Deficiency Act, 1913.

Candidates must not be more than forty-five years of age, and will be required to undertake Research work for the purpose of medical investigation into the causes of epilepsy and mental deficiency.

The person appointed will be required to devote his whole time to his official duties (a schedule of which will on application be forwarded to any prospective candidate), and the appointment will be subject to the provisions of the Poor Law Officers' Superannuation Act, 1896.

The remuneration will be £700 per annum (inclusive of War Bonus), and residential emoluments will be provided, consisting of a furnished house or apartments, board, laundry, and a servant, such emoluments being valued at £200 per annum for Superannuation purposes.

Applications, stating age, qualifications, and experience, and accompanied by copies of not more than three recent testimonials, must reach me not later than Thursday, 7th October, 1920. Canvassing strictly prohibited. JAMES CURTIS, Clerk to the Guardians.

Union Offices, Edmund-street, Birmingham, 22nd September, 1920.

Hull Royal Infirmary, Hull.—

Wanted at once, ASSISTANT HOUSE SURGEON. Salary £150 per annum.

Board and residence in each case. Applications, together with copies of recent testimonials, should be addressed to B. BROOKS, Secretary.

Norfolk County Mental Hospital,

Thorpe, Norwich. — A SECOND ASSISTANT MEDICAL OFFICER (Male) is required on the 1st October. Salary £350 per annum and all found, subject to 3% deduction under the Asylum Officers' Superannuation Act.

Applications, stating age, qualifications, and the usual particulars, to be addressed to the Medical Superintendent.

Wolverhampton and Staffordshire

GENERAL HOSPITAL.—A HOUSE SURGEON wanted. The Hospital contains 210 beds, including the usual special departments, and is recognised by the various Examining Bodies for a part of the requisite attendance on Medical and Surgical Practice. Candidates must be registered under the Medical Acts.

The appointment is for six months, with a salary at the rate of £200 per annum, board, furnished rooms, and laundry provided.

Application, with copies of testimonials, to the undersigned.

W. H. HARPER, House Governor and Secretary.

Wolverhampton, September 20th, 1920.

Radcliffe Infirmary and County

HOSPITAL, Oxford.—HOUSE PHYSICIAN (six months' appointment) wanted 1st December. Salary at the rate of £200 per annum, with board and laundry. The holder of this appointment is eligible for re-election, or for election to another resident appointment in the Hospital. Candidates must be male, qualified, and unmarried.

Four copies of three testimonials to be sent to the undersigned not later than 1st November.

G. C. RYND (Capt.), Secretary-Superintendent.

Radcliffe Infirmary and County

HOSPITAL, Oxford.—The Committee of Management invite applications for an ADMINISTRATOR of the above Hospital (daily average of in-patients 180, with an extension of 80 beds in progress), to begin his duties on or about 1st January, 1921, at a salary of not less than £600 per annum for the first year, with good prospect of advances.

The Administrator will be required to take charge of the Hospital, and in every way to further its interests.

The appointment will, in the first instance, be made for one year, after which period the position will be stabilised.

Forms of application may be obtained from the Rev. G. B. CRONSHAW, at The Queen's College, Oxford, and are to be returned on or before the 18th October, 1920.

Kent County Ophthalmic Hospital,

Maidstone.—Applications are invited for the post of HOUSE SURGEON, to commence duties on November 1st, 1920. Candidates must be single, doubly qualified Medical Practitioners of British nationality, with knowledge of Ophthalmology, Refraction, Aural, and Anæsthetic work. Salary £300 per annum, with board, comfortable suite of rooms, and laundry. Applications, with copies of three recent testimonials, to be sent to the undersigned by September 30th.

P. L. CAMP, Secretary.

The Royal National Hospital for

CONSUMPTION and DISEASES of the CHEST, Ventnor, Isle of Wight.—A Male ASSISTANT RESIDENT MEDICAL OFFICER is required for twelve months, to take up duties at an early date. Salary £300 per annum, with residence and board in the Hospital. Candidates must be recently doubly qualified, registered, and unmarried, and be desirous of undertaking the earnest study of tuberculosis. Applications, in candidate's own handwriting, stating age and qualifications (with one copy of three recent testimonials), may be sent to the Secretary, R.N.H.C., 18, Buckingham-street, Strand, London, W.C. 2.

County Borough of Wolverhampton —

EDUCATION COMMITTEE.—ASSISTANT SCHOOL MEDICAL OFFICER.—Applications are invited for the position of Assistant School Medical Officer. The selected applicant will be required to work under the direction of the School Medical Officer and to devote his (or her) whole time to the service of the Committee.

Salary will be at the inclusive rate of £500 per annum. Applications, stating age, qualifications, &c., together with copies of not more than three recent testimonials, must be forwarded to the undersigned by not later than 5th October, 1920

Canvassing will disqualify. T. A. WARREN, Director of Education.

Education Offices, Town Hall, Wolverhampton.

County Borough of Northampton

EDUCATION COMMITTEE.—WOMAN ASSISTANT SCHOOL MEDICAL OFFICER.—Applications are invited for the above appointment. Applicants must be duly qualified medical practitioners. The person appointed will be required to devote the whole of her time to the duties of her office, which will include the Medical Inspection of School Children and work at the School Clinic

Salary will be an inclusive one at the rate of £700 per annum.

Applications should be made on the prescribed form, which, with detailed particulars of the duties to be performed, can be obtained at this office, and should reach me on or before the 15th October, 1920.

Applicants should state any special qualifications they possess or experience they have had. A. C. BOYDE, Director of Education.

Education Offices, 4, St. Giles'-street, Northampton.

16th September, 1920.

North Riding County Asylum, Clifton,

York.—Temporary ASSISTANT MEDICAL OFFICER (Male, single) for prolonged duration if suitable. Salary at rate of Seven guineas per week, with board, lodging, and washing.

Apply immediately to Medical Superintendent.

Royal Southern Hospital, Liverpool.

Wanted, One HOUSE PHYSICIAN and One HOUSE SURGEON, to commence duties on the 1st October next. Salary at the rate of £100 per annum, with board and residence. The appointment will be for six months, but the elected candidates will be eligible for re-election for three further periods of six months.

Applications and copies of testimonials to be sent to the undersigned on or before Wednesday, 29th September, 1920.

Sept. 22nd, 1920. ALLEN NALDRETT, Superintendent & Secretary.

Middlesex Districts Joint Small-pox

HOSPITAL BOARD.—Applications are invited for the post of RESIDENT ASSISTANT MEDICAL OFFICER (Male) at Clare Hall Sanatorium and Hospital for Consumptives.

Salary £300 per annum, with residence, board, &c.

Applications, stating age, qualifications, experience, and date when at liberty, together with copy testimonials, to be forwarded to the Medical Superintendent, Clare Hall Sanatorium, South Mimms, near Barnet.

Leyton Urban District Council.—

EDUCATION COMMITTEE. — The Leyton Urban District Council invite applications for the post of OCULIST in the School Medical Service.

The principal duties required to be carried out will be Refraction work and prescribing Spectacles, and to act under the instructions of the School Medical Officer.

The salary will be at the rate of £125 per annum for one afternoon session of two hours per week.

Applications must be made on the prescribed form to be obtained from the undersigned, and must be sent to [illegible] not later than Saturday, 2nd October, 1920. R. VINCENT, Clerk.

Education Office, Town Hall, Leyton, E. 10, 22nd September, 1920.

Down District Asylum, Downpatrick.

ASSISTANT MEDICAL OFFICERS WANTED.

The Committee of Management of above Asylum, at their meeting on 16th October, propose to appoint Two Assistant Medical Officers (Male), single, registered. Salary £300 per annum, with allowances of furnished apartments, board, attendance, and laundry, valued at £130 per annum.

The appointments, which are terminable at any time by a month's notice [illegible] either side, are subject to the conditions of the Asylum Officers' Superannuation Act, 1909.

Application to be made on or before 11th October to Resident Medical Superintendent, stating age and qualifications and enclosing copies of testimonials.

Countess of Dufferin Fund, India.—

WOMEN'S MEDICAL SERVICE.—Three MEDICAL WOMEN required at once to fill vacant appointments for general service in the Women's Medical Service, India. Initial salary not less than Rs. 350 per mensem, with furnished quarters. Provident Fund in connection with the Service.

Applications to be sent, not later than October 12th, on the special forms which may be obtained, together with a copy of the Rules and Regulations of the Service, from Miss L. M. Brooks, c/o Sir Havelock Charles, India Office, Whitehall.

University of Sydney.

NEW SOUTH WALES, AUSTRALIA.

CHAIR OF DENTISTRY.

Applications are invited for the above position. Salary (fixed) £1100 per annum, and £150 allowed for travelling expenses to Sydney.

The successful candidate will be appointed for a period of seven years, but may be re-appointed. Duties commence 1st March, 1921.

Particulars may be obtained from the undersigned, to whom applications (in quadruplicate), stating age, qualifications, &c., accompanied by copies of not more than three testimonials, should be sent not later than Saturday, 9th October, 1920.

AGENT-GENERAL FOR NEW SOUTH WALES.

Australia House, Strand, London, W.C. 2, 7th September, 1920.

University of Sydney.

NEW SOUTH WALES, AUSTRALIA.

CHAIR OF PHYSIOLOGY.

Applications are invited from candidates qualified for the above position. Salary (fixed) £1150 per annum, and £150 allowed for travelling expenses to Sydney. Pension of £400 per annum, under certain conditions, after twenty years' service. Duties commence 1st March, 1921.

Particulars may be obtained from the undersigned, to whom applications (in quadruplicate), stating age and qualifications, and names of three referees, should be sent not later than Saturday, 9th October, 1920.

AGENT-GENERAL FOR NEW SOUTH WALES.

Australia House, Strand, London, W.C. 2, 7th September, 1920.

The South African School of Mines

and TECHNOLOGY, Johannesburg. (UNIVERSITY OF SOUTH AFRICA.)—The Council invites applications for the following appointment:—PROFESSORSHIP OF VETERINARY ANATOMY.

Must have sound knowledge chief branches Veterinary Science, but specially qualified in Veterinary Anatomy. Salary £860 per annum, rising £30 annually to maximum of £1100. Appointment probationary for first two years. Allowance for travelling expenses £60 and half salary from sailing date until arrival. Duties commence 15th February, 1921.

Medical certificate required before appointment. Age to be stated. Applications and testimonials, all in triplicate, to be sent to undersigned by 11th October. Further particulars may be obtained on application to CHALMERS, GUTHRIE & Co., LIMITED, 9, Idol-lane, London, E.C.3.

COLONIAL SERVICE.

Medical Officers are required for the

WEST AFRICAN MEDICAL STAFF, and also for the GOVERNMENT SERVICE in MALAYA, the EAST AFRICAN PROTECTORATES, the WEST INDIES (including BRITISH GUIANA), FIJI, and the WESTERN PACIFIC, &c., &c.

The conditions of service differ widely in the various Colonies and Protectorates, but in general the appointments are permanent and pensionable (after a period of probation), and free passages are provided to the place of appointment.

Particulars of vacancies and forms of application can be obtained from the

Assistant Private Secretary (Appointments),
Colonial Office,
Downing Street,
London, S.W.1.

To former Students of the London

School of Tropical Medicine or others who [illegible] expert in Tropical Medicine.—Wanted, to proceed to a healthy part of Africa, an EXPERT in TROPICAL DISEASES, with competent knowledge of Bacteriology, Protozoology, and Helminthology. Salary £1000 per annum, together with free travelling. All apparatus will be found. For further information apply to the Secretary, London School of Tropical Medicine, Seamen's Hospital Society, Greenwich, S.E.

Persian Gulf.—Junior Medical

OFFICER (not over thirty) required for Oil Refinery. Salary £750, with free quarters and servants.—Apply, General Manager, Scholastic, Clerical, and Medical Assn., Ltd., 22, Craven-street, London, W.C. 2.

Cadet Training Ship "St. George."

MEDICAL OFFICER required for three months' voyage to Las Palmas.—For particulars of duties and remuneration apply to the Managers, Devitt and Moore, 12, Fenchurch Buildings, E.C.3.

Ship's Surgeon. — Messrs. Elder

Dempster and Co., Limited, have a few vacancies for Surgeons in their West African Service. Pay £20 per month. Fees allowed for attendance on passengers. Length of voyage varies from six to ten weeks, according to particular route.—Apply, Medical Superintendent, Messrs. Elder Dempster and Co., Limited, Colonial House, Liverpool.

Wanted, in a Seaside middle-class

Practice, a young unmarried ASSISTANT with view to Partnership. Residence in Branch Surgery. Small panel.—Address, No. 345, THE LANCET Office, 423, Strand, W.C. 2.

Assistant wanted within 30 miles of London. Married and with experience in Eye work, Electro-Therapeutics, and Anæsthetics preferred. Usual bond. Salary £450 and unfurnished house.—Address, No. 326, THE LANCET Office, 423, Strand, W.C. 2.

Wanted, young qualified in-door ASSISTANT for Practice in Monmouthshire. Good experience to be obtained. Salary £400. Usual bond.—Address, stating age and full particulars, No. 352, THE LANCET Office, 423, Strand, W.C. 2.

Wanted, an Assistant, under 40. London Suburb. Salary £400 and commission on Mids. Half-holiday each week. Car kept.—Address, No. 357, THE LANCET Office, 423, Strand, W.C. 2.

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at short notice.

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Telegrams: "LOCUM, BIRMINGHAM." Telephone: 1116 CENTRAL.

NOTE Change of Address.

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Laboratory Assistant (Lady) requires Post. Five years' experience under eminent Bacteriologists. Full knowledge of routine Laboratory work, Vaccines, Wassermanns, &c. Also French, German, and typewriting. Would undertake combined Secretarial work.—Address, No. 356, THE LANCET Office, 423, Strand, W.C. 2.

Nurse-Secretary desires post with Doctor (Oculist). Sister's experience Eye Hospital. Good theatre work. Interview London.—Address, No. 350, THE LANCET Office, 423, Strand, W.C. 2.

Secretarial work in London required by Woman Student of Psychoanalysis. Knowledge of French and German (medical terms) typewriting. Qualified Swedish medical gymnast.—Address, E. M. D., 27, Gordon-square, W.C. 1.

Private Car for Hire.—Lady owner-driver of smart Arrol-Johnson Touring Car wishes to arrange Contracts with Medical Man—one or more days per week for a period. Moderate terms. Any district or distance.

'Phone Lee Green 807, or write Miss Ponting, 54, Lee-road, Blackheath, S.E.

The Women's Legion, 447, Oxford-street, W., have several Ex-V.A.D.'s applying for positions as Doctors' MAID-ATTENDANTS.—Apply, Staff Controller.

Wanted by M.B., F.R.C.S., a PRACTICE or PARTNERSHIP in healthy place in Midlands or South, with scope for Surgery. Income £1200 to £1500.—Apply, Blundell & Co., Walter House, 418-422, Strand, W.C. 2.

Wanted, a Country or Country Town PRACTICE producing not less than £1000 per annum. Good house and garden essential. Can settle at once.—Send details, in confidence, to T., care of Arnold & Sons, Transfer Dept., 6, Giltspur-street, London, E.C. 1 (opposite St. Bartholomew's Hospital).

Wanted, a Practice worked at a Lock-up Surgery within twenty minutes of Bond-street.—Address, No. 355 THE LANCET Office, 423, Strand, W.C. 2.

Wanted, Cash and Panel Practice in London or Suburbs. Can pay £600 down and the balance by instalments. Free to settle at once.—Send details, in confidence, to E., care of Arnold & Sons, Transfer Dept., 6, Giltspur-street, London, E.C. 1 (opposite St. Bartholomew's Hospital).

Wanted by M.R.C.S., a Practice of £1500 or more in nice residential part near London, such as Woking, Windsor, Egham, Weybridge, &c.—Apply, Blundell & Co., Walter House, 418-422, Strand, W.C. 2.

Wanted, Practice returning £800 to £1200 in Somerset, Devon, or Dorset. Should be near the Coast, and permit of fishing and boating. The house must be a good one, and capable of being secured by purchase or lease. Ample capital available.—Apply, H. W. R., Messrs. Ferris & Company, Ltd., Bristol.

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Death Vacancy.—West of England.—JUNIOR PARTNER wanted in old-established unopposed Practice in good sporting district on line of rail. One-third Share offered at present guaranteed not less than £500 a year. Unusual scope.—Apply, No. 6829, care of Mr. Percival Turner, 4, Adam-street, London, W.C. 2.

South Coast.—A Partner (single) required in an old-established Practice situated at a favourite Seaside resort. Receipts 1919 over £2000. Panel list 2200. Fees 2s. 6d. upwards, excellent scope for increase. Premium One-third Share £1600.—Quote Folio 1258, Arnold & Sons, Transfer Dept., 6, Giltspur-street, London, E.C. 1 (opposite St. Bartholomew's Hospital).

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THE LANCET

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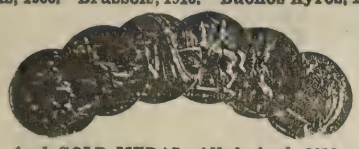

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